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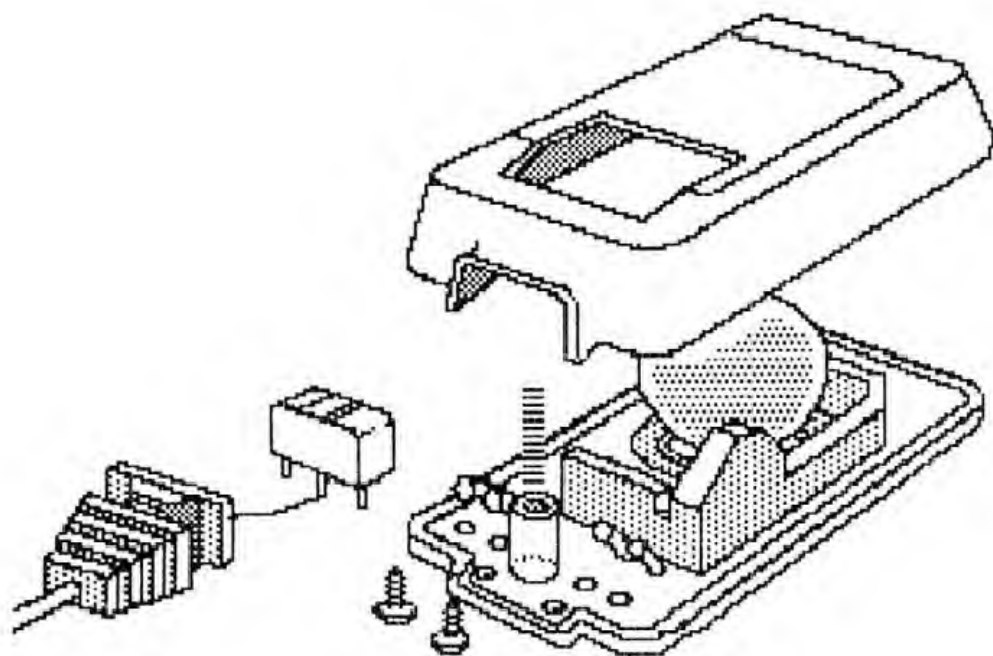
THE JOURNAL
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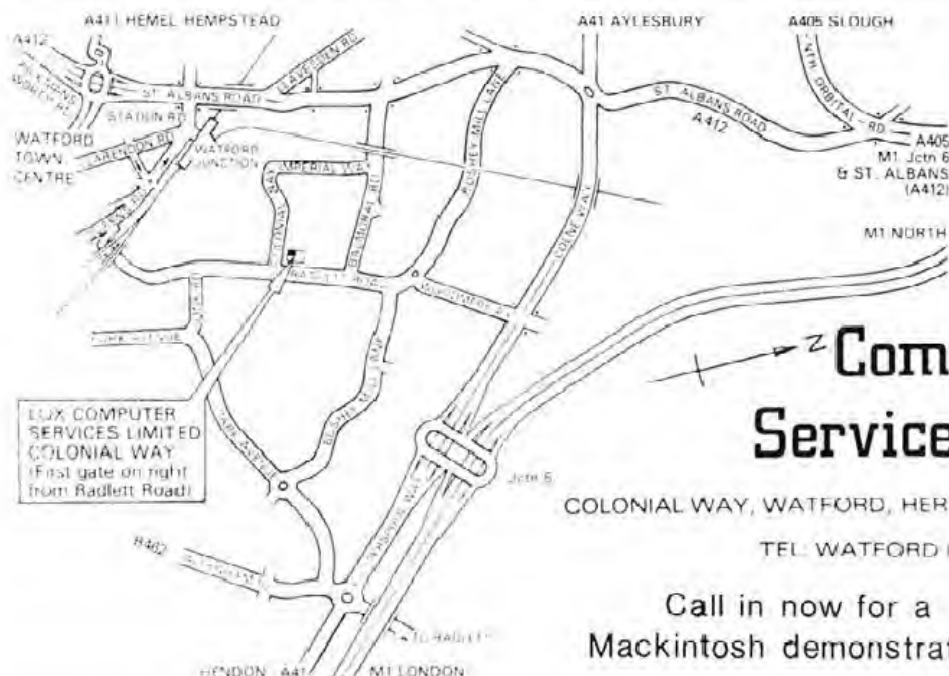


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Front Cover: Mouse II revealed - drawn using Mousepaint on an Apple //e with an Imagewriter.

Editorial

This issue we have put the emphasis on printers. Among the items is a survey. Please answer the questions if you possibly can. The sort of summary we should be able to produce can only be put together with your aid. If we receive a poor response we will know that there is no point in doing any more surveys, so it is up to you. Please help - after all, isn't one of the reasons for joining to exchange information?

In the next issue we hope to start a series on Expert Systems (Artificial Intelligence). If there are any other topics you would like to see covered, do let us know. If there is something you can write about, please do: All contributions to Hardcore are welcome and if you can send it in on disk, that's even better. Also do let us know if you have something you would like put in the diary. It's irritating to get a poor turnout just because people didn't know anything was happening and disappointing to discover that you missed something you would have liked to attend.

We are also repeating some of our earlier Beginners Pages, updated where necessary, as new members often complain that there is nothing simple for them to get started on. These are orientated towards programming since this is where most beginners have problems.

We would like to put more programming into the magazine but seem to have few people keen to write on this. If you have been hiding your light under a bushel, please get in touch. You'd be surprised how many people say "I didn't think I knew enough" and then write a major article. Even if all you have is a programming tip, do share it.

Last, but not least, we are always ready to help you by printing small ads, advertising your existence if you are a Lonely Apple or hoping to set up a Local Group or by printing your letter. We try to get an answer to any problems that come up in the letters we print so if you want help, advice, etc. try to get your letter in early to give us time to discover someone who knows about these things.

Chairman's Corner

As I sit typing into Applewriter, the news has just come through that we are about 40% up on our membership, compared to this time last year. New memberships are coming through at a faster rate than for nearly two years. On Saturday, we had one of the most enjoyable meetings ever (see John Rogers' report elsewhere), and the bulletin board has been restored to its full glory. We have just got a volunteer to organise courses, which have been less frequent recently. On top of all this, some very interesting new items have been sent for assessment for Special Release Software. Micronet have now given us a closed user group, that is, an area of Prestel reserved for our members.

In some areas, things have slowed down, in particular meetings. We have received no offers of help in arranging meetings, and so it looks likely that there will be no more national meetings until the AGM. Is there no-one out there who can give a few hours a month to keep this area going ??? No previous experience is necessary, nor any knowledge of the Apple. The most important qualification is a belief that an opportunity for users to get together to help each other is worthwhile. Perhaps it is because Apple users are so well served by their friendly, expert local dealers and by Apple UK that BASUG has no role here (?????).

Clearly, some of you will be thinking of putting yourselves forward for the BASUG committee at the AGM. If you would like to discuss what this involves with me at any time, please give me a ring. (You don't have to be on the committee to help, offers are always welcome). Remember BASUG is a club, not a commercial concern, and we are always glad to hear from you. We can't promise that all letters are replied to in detail, but I can promise you that they are all read, and that comments and suggestions from members are always very welcome.

By the way, when we released the Special Release Software, we asked for you, the users, to review or comment on the software: In particular Graphic Pad was documented and programmed in such a way that users could expand and modify it. If anybody has any comments or enhancements, please let us know.

Printer Interfaces

by Chris Murphy

1. Introduction.

Some of you with long (and charitable) memories may recall a short series of articles in early editions of *Hardcore*, where the different types of printer interface boards available for the Apple were examined in brief. Having been prevailed upon to put pen to paper (?) once more, I shall be writing about parallel and serial printer interfaces in more general terms in an attempt to explain a little of how they work. Having already dealt with the interface cards used in the Apple II in the earlier series of articles, in these articles I want to concentrate more on the way information is exchanged between the computer and the printer, and in particular at the way the printer communicates with the computer. The first type to be considered is the parallel printer.

2. Parallel Printer Interfaces.

The parallel interface is the simpler of the two types of interfaces to describe and implement. It is called "parallel" because data being transmitted is sent as a number of bits down separate signal lines at the same time, so that they follow a parallel path (O.K. - so you knew that already!) Parallel interfacing is used in other parts of the Apple, e.g. the keyboard. However, we shall concern ourselves with eight-bit parallel printer interfaces, and as one of the commonest types of low-cost printers on the market at present is the Epson range, I shall use the interface on the Epson RX-80 as an example of the way a parallel printer works.

The interface handles only one type of signal down each line, and this is either High or Low, based on standard TTL levels. The signals can be grouped into four types, which are synchronization signals, handshaking signals, data bits (High for 1, low for 0), and fault lines. To examine each of these in a little more detail, first let's consider what happens when we want to take our latest wonderful program and get a hard copy of it. The task is simple; the information in the computer's memory is to be sent via a parallel port to a printer, so we now have a transmitting device and a

receiving device and a cable connecting the two. The first job is for the transmitting device to ensure that it has a receiving device, and that the two are capable of talking to each other. This is handled by synchronization lines. Secondly the transmitter needs to know when the receiver is ready or not ready for receiving information. This is handled by handshake signals. From time to time, errors may occur on the receiving device, for example paper out or end of ribbon, so particular signal lines may be used to indicate particular fault conditions. Finally, when all is working in harmony, we have eight signal lines each carrying 1 bit of data.

The connector used is a 36-pin Amphenol connector, which is the normal type of connector on 8-bit parallel interfaces (although there are certain companies such as IBM who use 25-pin D-connectors on certain parallel interfaces on the PC) and consists of a metal shell surrounding a plug with a tongue with 36 contacts which fits into the socket on the back of the Epson printer. The 36 pins and the signal names which pass down them are as follows:-

Signal pin	Return pin	Signal	Dir.
1	19	STROBE	in
2	20	DATA1	in
3	21	DATA2	in
4	22	DATA3	in
5	23	DATA4	in
6	24	DATA5	in
7	25	DATA6	in
8	26	DATA7	in
9	27	DATA8	in
10	28	ACKNLG	out
11	29	BUSY	out
12	30	PE	out
13	-	+5v	out
14	-	AUTOFEED XT	in
15	not used		
16	-	0v	Logic gnd
17	-	CHASSIS GND	
18	not used		
19-30		GND	
(These are twisted pair return signal ground lines)			
31	-	INIT	in
32	-	ERROR	out
33	-	GND	
34	not used		
35	-	+5v	
36	-	SLCT IN	in

Before we consider these lines in more detail, the headings on the above table show that most signal lines have a corresponding ground line. The signal names in capitals will be explained in more detail. The "Dir." column refers to the direction of the signal; "in" indicates that it comes from the computer to the printer, whilst "out" is a signal from the printer to the computer.

Above, the term Synchronization was mentioned. In order for the two devices to be able to work in harmony, the STROBE line is used. In the case of the Epson, a low pulse is used to indicate activity. So whenever the computer wishes to send data to the printer, the STROBE line goes low and the character to be transmitted is sent as bits down DATA1 to DATA8. Each data line corresponds to the appropriate bit in the character being sent. The precise sequence in which this takes place is referred to as the Interface Timing. In the case of the Epson, it requires the data line signals to be held High for a minimum of 1.5 microseconds, with a minimum of 0.5 μ s between the data lines going high and STROBE going low. The STROBE pulse width must be a minimum of 0.5 μ s and there must be a minimum delay of 0.5 μ s between the end of the STROBE pulse and the data lines going low. So, provided all is correct, the data lines go high, STROBE goes low, then there is a short delay while the data is dealt with. The

computer will then wait until the printer sends back ACKNLG, usually after about 3 to 4 μ s. In the Epson's case, ACKNLG is a low pulse of approximately 12 μ s duration, and indicates that the data has been received, and that the printer is ready to receive more.

If, however, all is not well, then the printer will respond by raising BUSY high. This indicates that the printer is not ready to receive data, and could occur for one of the following reasons:-

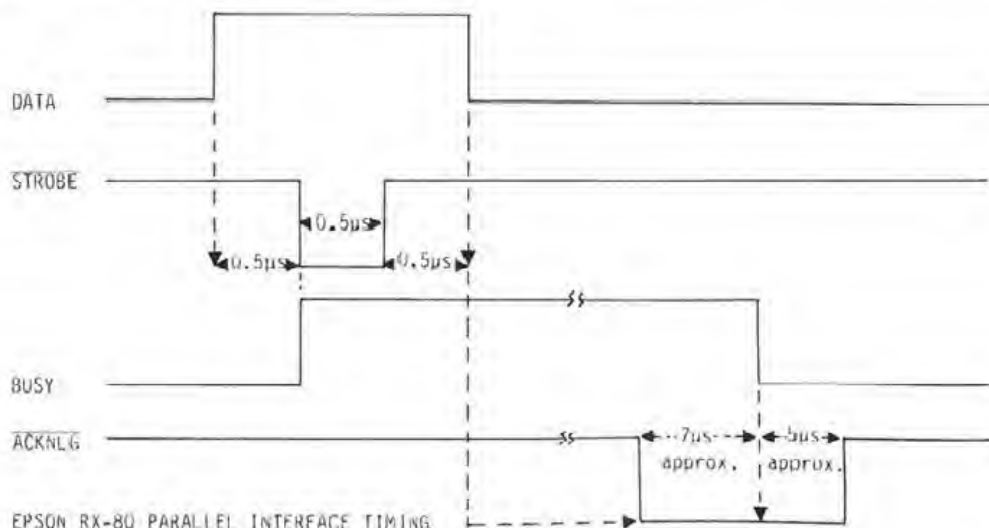
The printer buffer is nearly full.

Paper movement (e.g. carriage return, line feed or form feed).

The printer is OFF line.

There is an error.

If the reason is one of the first two, then the BUSY line will clear once the buffer is emptied or the paper movement is completed, and the ACKNLG pulse will be sent after the delay period. If the reason is an error, then the BUSY will not be cleared until the error is removed. The STROBE signal mentioned above is used to clock the data present on the highway, and will prevent further data being sent until the error is cleared. The relationship between the various signals is shown in the diagram below:-



Note:- All timings are MINIMUM unless otherwise stated.

In addition to BUSY, other signal lines may indicate that all is not well. Pin 12 (PE) is used to indicate that the printer is out of paper, and will go high if this is true. Pin 32 (ERROR) may also be used for signalling problems, and this will go low if either there is no paper in the printer, the printer is off-line, or there is an unclassified error which prevents the printer from functioning. The handling of the busy signalling and error conditions sent by the printer is handled by the interface on the computer. Not all will monitor pin 12 for example, therefore on the Epson, paper-out will activate pins 11, 12 and 32.

The other pins in the chart above which have not yet been mentioned are as follows:-

AUTOFEED XT - If this signal is low, an automatic line feed is generated after the completion of a printed line.

INIT - This line is normally held high, but if it goes low, the printer will be reset to its power-on state, and the printer buffer is cleared. As far as the Apple is concerned, this line is not normally used, but other micro systems with built-in parallel interfaces may use this line during power-up or reset sequences to test if there is a device connected to the parallel port.

SLCT IN - This may be used by the computer to control the passing of data to the printer. Data can only be sent when this signal is low. In the case of the Epson, this is normally factory-set on an option switch.

The parallel interface on the Epson printer is fairly typical of this type of interface, and most commonly available parallel printers will use an interface very similar to this. This type of setup is often referred to as a Centronics interface, and one can usually be fairly sure that, for example, a cable used with a particular printer to connect to the parallel port on one type of micro will probably also work with a different micro with a parallel port. The major variations between different types of printers will be on the STROBE and ACKNLG lines. Some may require STROBE high for synchronization, or may send ACKNLG high to indicate acceptance of incoming data. The Apple parallel interface board has a jumper block which may be configured to suit these variations.

To summarise then, the parallel interface is essentially a simple type of interface to implement, requiring one signal line for synchronization and two for handshaking, whilst possessing eight data lines. However, because of the requirement for every signal line to be grounded to eliminate "noise", the restriction of parallel interfacing for printers is that the length of cable connecting the computer and the printer should be as short as possible, otherwise the longer the cable, the greater the risk of signal degradation due to "crosstalk" between the signal lines. Parallel cables rarely stretch more than a few feet at most. For transmitting over longer distances, the serial interface is used.

3. Serial Interfaces.

This type of interface gets its name from the fact that data is sent as a series of bits, one after the other. There are a number of types of serial interface, but the one which we shall be considering is the RS 232C interface. This type is used primarily for data communications down telephone lines, and also for the vast majority of VDU terminals on mainframes, mini-computers, and micro systems requiring a separate screen and keyboard but it is also commonly found as a printer interface. The advantage of an RS 232 interface is that there is no restriction on the distance of the transmission as there is with parallel interfaces, although the longer the cable, the more likely you are to need some form of signal booster. Unlike the Centronics type of interface, the only standardisation on the RS 232 interface is the way in which data is transmitted, and the names given to particular pins on the connector.

As mentioned above, data is carried as a stream of bits. The transmitting device takes characters and converts them to binary bit patterns, whilst the receiving device has the task of re-assembling these into characters. Thus there are a number of requirements on the interface. The first is some means of protocol, so that the device which is receiving the stream of bits knows what patterns are significant, and also knows how to check for errors. Data is normally transmitted in one of two ways, as synchronous or asynchronous. In the first case, data is built up into blocks, and transmitted as such with control

information at the start and end of each block. This type of transmission is commonly used in data communications, for example in transmitting quantities of data to a mainframe computer. One of the simplest forms is IBM 2780 protocol, where the blocks of data are 80 characters long, and appear as the equivalent of a punched card to the receiving computer. The second type, asynchronous, which is the method normally employed by printers, is for the data to be transmitted character by character, and it is this that we shall examine in more detail.

Receive and transmit signal voltages are nominally plus or minus 12vDC. ASCII characters are sent as ten or eleven bits of binary information, with space (+12vDC) representing binary 0 and mark (-12vDC) representing binary 1. The data line will be in a mark state between code transmissions, and the start of a transmission is begun by the transmitting device raising the data line to space (+12vDC) for the time period of one bit. The length of time which the data line remains at space will depend on the baud rate (see below for a definition of this). This is referred to as the start bit. This is then followed by seven or eight bits of data representing the binary value of the ASCII character being sent. The first bit is the least significant bit. The eighth bit may be used as a parity bit, and this is normally used to detect errors in transmission. There are methods in which the parity bit may be used:-

Mark parity. In this case, when receiving, the receiving device will ignore the state of the parity bit, and when transmitting the parity bit is set to mark. This is generally the "No Parity" state.

Space parity. In this case, when receiving, the receiving device will ignore the state of the parity bit, and when transmitting the parity bit is set to space.

Even parity. When this is used, the parity bit is set to mark or space as appropriate to ensure that there are an EVEN number of 1 bits in the transmission (excluding start or stop bits). Thus the transmitting device will set this bit as appropriate, and if the receiving device does not receive an even number of 1 bits, then an error in transmission has occurred, referred to as a parity error.

Odd parity. When this is used, the parity bit is set to mark or space as appropriate to ensure that there are an ODD

number of 1 bits in the transmission (excluding start or stop bits). Thus the transmitting device will set this bit as appropriate, and if the receiving device does not receive an odd number of 1 bits, then a parity error is detected.

(Which reminds me of the world's oldest computer joke -

Q. What sits repeating "Pieces of seven, pieces of seven"?

A. A parrotty error.

Sorry!)

The last piece of information is the stop bit or bits. The data line must be brought low to the mark state for a minimum of 1 bit period to signify the end of a character. One or two stop bits are usual, but in some cases, one and a half may be encountered. Transmission of the next character can begin immediately after the stop bit or bits have been sent. At speeds below 300 baud, two stop bits are usual. At speeds above this, there is no hard and fast rule.

The transmission of information is usually in one of two ways, **Half** or **Full Duplex**. In **Half Duplex**, two-way transmission is possible, but only in one direction at a time. In **Full Duplex**, two-way transmission can take place at the same time. Most serial printers and VDU terminals operate in **Full Duplex** mode.

Having considered the format of the data, we must now look at the way the transmitter and receiver signal to each other in more detail. The speed at which information is passed down the line is referred to as the **Baud rate**. Very approximately, the baud rate divided by ten is the equivalent of the number of characters per second passing down the line. So 300 baud is roughly 30 characters per second, 9600 baud is 960 characters per second. Taking the example of printers, it is generally true that the computer can send information to the printer faster than it can deal with it, therefore some form of handshake is required. Also, the printer needs to be able to communicate with the computer to prevent further data being sent if, for example, the paper or ribbon runs out. There are two methods of handling this, which may be used independently or simultaneously. The first is a hardware handshake, where one or more signal lines on the RS 232 interface connector are used for busy signalling. The second method is to use a software

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handshake, otherwise referred to as a handshaking protocol.

A hardware handshake involves using one or more of the signal lines in the interface to indicate not ready. The usual type of connector on the RS 232C interface is a 25-pin D-type connector. With RS 232C, the one standard is the labelling of the signals carried on each pin. Although there are 25 in total, the commonly used ones are as follows:-

Pin Name Usual use

1	FG	Frame Ground
2	TXD	Transmitted data
3	RXD	Received data
4	RTS	Request to send
5	CTS	Clear to send
6	DSR	Data set ready
7	SG	Signal ground
8	CD	Carrier detect
20	DTR	Data terminal ready

As may be deduced from the names, some of these are specifically for communication with modems. The commonest type of hardware handshake used by serial printers is pin 20 (DTR). This is held high whilst the printer is ready to receive data, and goes low when the printer is not ready, either because the buffer is full, or there is some form of fault such as a ribbon jam or the paper has run out. This signal line can then be connected to the appropriate pin on the serial interface on the computer. You may find this referred to as DTR protocol. However, not all serial interfaces are capable of hardware handshaking, as this can increase the complexity of the interface. In these circumstances, the handshake may be handled by a software protocol, whereby the printer sends a message to the computer via a data line whenever it is on the point of being not ready. The two common types of software handshake are ETX/ACK and XON/XOFF.

In ETX/ACK mode, the computer sends blocks of characters (typically 256 bytes) to the printer. Each block is terminated by ETX (ASCII 03). The computer then stops transmitting. The printer processes the received characters on a first-in, first-out basis until it encounters the ETX code. It will then transmit ACK (ASCII 06) back to the computer to indicate that it is ready to receive more data. Having received this, the computer will then continue with the next block of data.

In XON/XOFF mode, ASCII codes DC1 (XON - Decimal ASCII 17) and DC3 (XOFF - Decimal ASCII 19) are used by the printer to signal its status back to the computer. You may already have encountered these on keyboards, as a number of systems respond to CTRL-S (i.e. DC3 or XOFF) as a command to pause a listing on the screen, and to CTRL-Q (DC1 or XON) as resume. When used by printers, when the printer's buffer is nearly full, the printer will send XOFF to the computer, indicating that it should stop sending. When the buffer is empty (or nearly so) the printer will then transmit XON to indicate that the computer may continue sending.

The difference between serial and parallel interfaces when it comes to connecting a printer to different types of computer or port is that a printer cable for a printer with a Centronics interface will probably be applicable for connecting that printer to a number of different computers. For example, a cable to connect an Epson RX-80 to an Epson QX-10 micro can also be used to connect that printer to an ACT Sirius, an ACT Apricot and a Wang P.C. It can probably also be used to connect different printers with Centronics interfaces to the same computers. However, a serial cable to connect one particular type of printer to one particular type of computer will, as a pretty invariable rule, NOT work to connect that printer to a different type of computer, or a different type of printer to the same computer. In conjunction with this article, I have sent to BASUG for the Literature Library a series of pin-out charts for connecting a number of different printers (and VDU Terminals) to the Apple via the CCS 7710A Asynchronous serial card, which is certainly one of easier cards to wire up your own cables for. I would strongly urge that anyone else who has such details should also forward them. The printers are:-

Qume Sprint 9/11/12, NDR 8000 series, Facit 4510/4512 and Epson 8143/8145 Serial interface adapters for the MX/RX/FX range.

In conclusion, I hope that this article has done a little to demistify at least some of the terminology used with regard to printer interfaces.

See pin-out charts with a couple of additions elsewhere in this issue.

A Disabled User Says

by Hugh T Slater

The Apple being a non-human device, it does not worry about how long it takes for you to give a command and also being of a very reliable nature, it can work for a long time without complaining and it is a very obedient servant. There are a lot more disabled with micros who find them a great help in their daily lives. Many of these people would not be able to talk to the outside world without their micros - thank God for them! There is one thing in favour of the disabled - they have the time and patience to work with their computers and can achieve very good results without feeling that they are holding someone up.

I have owned my Apple II for about three years now and have enjoyed every moment of it. It was bought for me by Aidis Trust. My system is made up of one Apple II, one VDU, two disk drives, one printer and an expanded keyboard which I use with my feet. The keyboard was built by an A-level student. He worked with me to design it. Not only is it very comfortable to operate over long periods of time but it also looks as if it was made by Apple. The other thing about this keyboard which makes it very special is that it does not interfere with the main system and so allows two people to use it at once. The electronics were designed by two people. The first is John Flack who himself is in a wheelchair and has set himself up in business to adapt computers for disabled users. The other person involved is Paul Tippell who is an electronics lecturer at Richmond-upon-Thames College and who has a group which creates and makes toys for handicapped children. Without these people I would find it very difficult to use my micro.

The only trouble is that the software for these machines is beyond most people's pockets. There is a great need for specialised software and hardware to help with the problems involved at a much lower cost, so that more disabled persons can get more out of their own environment. One example of this is somebody with a speech defect being able to go into a shop with a list of things that they need without the aggravation of the shopkeeper not being able

to understand them. Last year I went to the Apple Meet at Slough where I saw lots of very good hard- and software. One of the devices there was Voice Input which would be very useful in the above situation. Once you have trained the computer to recognise a person's voice, it can do all sorts of things like turn on lights, TVs and lots more. Even with a discount for being disabled, the system still cost seven hundred pounds. All together I could have spent about three thousand pounds on things to make my life easier and more enjoyable.

I am hoping that, in the not too distant future, these problems between the user and the manufacturer of both hard- and software will be solved, so that the likes of me and many handicapped people can get the most out of their own computers and in return they will be able to give back what they have had given to them.

Competition

Here is an interesting problem sent to us by Pete Kemp of Prescot, Merseyside.

Switch on your Apple without a disk and press reset, so you're working without DOS and enter the following program:-

```
10 GET A$  
20 PRINT VAL (A$)  
30 GOTO 10
```

RUN it and then press any of the keys 1 thru 9.

Could someone please explain why it gives such a screwy answer the first time round - and why you don't get the same result if DOS is loaded?

Do try this little gem - you'll never guess the answer just looking at the program.

Solutions should be sent in by 4th May. Please don't forget to include your name and address.

Beginners' Page

By John Sharp

There are a number of manuals with your Apple which you cannot read and digest all at once. If you have a knowledge of Basic you can start programming straight away, however, you will still encounter the quirks of the Apple, as you would with any machine. Some of the items below you might come across in the manual, some you might learn by accident, whereas others you read about or someone tells you about them. The manuals are not always as clear as they could be so if you think you can write it up more clearly then please do so.

POKE 33,33.

One of the first problems you will come across, especially if you are not a good typist, is the problem of editing a mistyped PRINT statement which has a string which is more than 40 characters long. You then put up a listing to alter a particular word, and having altered it, run along with the cursor to copy the line. Then you run the line and, lo and behold, there is a long space in the middle, usually in the middle of a word. What has happened is that you have copied this space in by adding to your string the space at the end of a line and beginning of the next, that the Apple puts up to make listings easier to read. The screen is set to 40 characters but the listing does not use all of them. An example is easier to demonstrate than put down in writing, but let's try :-

```
10 PRINT "THIS IS A LINE OF RUBBISH TO EXPLAIN"
```

becomes on listing :-

```
10 PRINT "THIS IS A LINE OF RUBBISH TO EXPLAIN"
```

If you copy this with the cursor and then run this instead of :-

```
THIS IS A LINE OF RUBBISH TO EXPLAIN
```

you will get:-

```
THIS IS A LINE OF RUBBISH TO EXPLAIN
```

There are a number of ways to overcome this problem. You could type the line again, which is a bit time-consuming. You could put end of quotes followed by a semi-colon and re-open quotes, so that the printing continued on the same line. You could follow the procedure of moving the cursor along with ESC K so that it did not exactly copy but just moved it physically. This has some drawbacks in that you can easily add one space that you didn't intend to. It is also time-consuming.

The best way is to use POKE 33,33 before you list the line. However before you do this do a HOME to clear the screen. Now list the line you wish to edit which will look like:-

```
10 PRINT "THIS IS A LINE OF RUBBISH TO EXPLAIN"
```

Now run the cursor along and copy the line and you will see that there is no space at the end and beginning of the line; it will copy the string faithfully. When you run it you will have no problems at all.

Before running however, type TEXT to return you to the correct screen window width. It is a good idea to have the first line of any program as:-

```
TEXT: HOME
```

to not only clear the screen, but set the correct window.

PUTTING MACHINE CODE PROGRAMS INTO YOUR APPLE.

It is often hard enough to cope with Basic when you first start with your Apple, but you may want to use a machine code program as well. A listing in a magazine might use a machine code routine as a means of speeding up the program, or to put a shape table in for graphics. It is easy to do. You don't have to understand it to use it, providing there are no bugs in it of course.

The procedure is in the Reference Manual, but if you are not familiar with machine code you may not know what to do or what to load from a particular listing.

The simplest listing is the machine code in hex. This will look something like:-

```
0300-A9 4C A2 10 A0 03 8D F5 03
```

In order to type this in, CALL -151 to get into the the monitor, which should give you

the * prompt. Now type the number at the beginning of the line (i.e. 300) and follow it with a colon (:) so that you have:-

300:
NOT 300- as this is a listing start and not an input start.

Now type the numbers in as they are in the rest of the line, with a space between them and press RETURN.

Now continuing with the the next line in your program in the same way you can load the whole program into memory.

You may come across a program which has been disassembled. This will look like:-

```
0300- A9 4C      LDA #$4C
0302- A2 10      LDX #$10
0304- A0 03      LDY #$03
0306- 8D F5 03   STA $03F5
```

If you compare this with the above line 300 then you will see that the numbers in the second column taken in sequence are the same. These are the ones you need to type in, in the way described above, and ignore the rest.

When you have gone all the way down the page check that you have not made any errors by typing 300L and pressing RETURN. The listing should come up exactly as it is printed in the magazine. If a line is wrong, type that line number followed by a colon as before, and then RETURN. Do the 300L listing and recheck. If the part you can see is OK then just type L, followed by RETURN and you will see the rest.

Now you will want to save it to tape or disk. For tape type:-
300.34FW and RETURN.

This is interpreted:- WRITE the memory locations 300 to 34F (in Hex) onto the tape, where 34F is the last address in the program. When you come to load it back into your machine then you will need to type:-

300.34FR

and RETURN when the tone starts. This is interpreted as READ into locations 300 to 34F.

If you have disk then to load the program, go back into Basic by typing CONTROL C, then:-
BSAVE PROGRAM NAME,A\$300,L\$4F
and press RETURN.

Exhibitions

It is April again and another season of computer shows is just about to get under way. BASUG has already agreed to appear at three major national exhibitions and is waiting for confirmation that we will have a space at the U.K.'s leading Apple Show - APPLE 84. This is being held once again at the Fulcrum Centre, Slough and is run by Database Publications, the publishers of Apple User magazine.

Two of the local Southern groups will be represented at the Fifth London Computer Fair which is run by the Association of London Computer Clubs and held at Central Hall, Westminster. Originally the fair was to be a three day event but for various reasons has been cut down to one day only. The clubs taking part are the South West London group from the Raynes Park area and the Hertfordshire contingent who meet at Park Street near St. Albans. If you live near to one of these areas and are interested in finding out just what a local group get up to once a month then come along and have a chat. The fair is to be held on Saturday 21st April.

The list below is a round up of the venues that BASUG expect to be attending as known at the beginning of March. Other times, dates and places will be printed on these pages or in a convenient update as soon as they are known.

5th London Computer Fair	21 April
Midlands Fair at Birmingham	4-7 May
Apple 84 at Slough	24-26 May
London Fair at Earls Court	14-17 June
PCW Show at Olympia London	19-23 Sept

As mentioned in the February edition, would members willing to assist at any of the above shows for half a day or longer, please contact us as soon as possible by post or telephone (or even via the BASUG bulletin board). All the exhibitions will have someone there who has past experience at manning a stand so you are not being asked to fend for yourselves. Any members regardless of their computing experience are welcome.

Fontrix

by Peter Trinder

There have been a number of software programs marketed for Apple Computers for producing fancy printing and graphics using the hi-res screen including Apple's own Toolkit and the independent Higher Text. Fontrix is different in several respects and very easy to use.

What do you get with FONTRIX? The program is on one disk which is not protected so you can make a back-up copy for your own use. There are three additional disks which contain additional fonts. Of course there is a manual in a ring binder and prepared using Fontrix. It is clear and contains all that is needed to guide new or experienced users. There are tables for setting the printer switches and a section on trouble shooting.

There are three main parts to FONTRIX - the GRAPHICWRITER, FONTEDITOR and the PRINT GRAPHICS driver. GRAPHIC WRITER lets you prepare a graphic screen using the fonts provided or fonts that you can create (see below). Note that the 'fonts' can be graphic shapes not just letters!

The interesting feature of FONTRIX is that the GRAPHIC WRITER allows you not only to create a hi-res screen (common to other packages) BUT to create a GRAFFILE (tm). A GRAFFILE is a 'GRAPHIC' file on disk that is 'OPENED' and 'CLOSED' by the user and can allow the Graphics screen to scroll horizontally or vertically by the number of sectors specified by the user on OPENING the GRAFFILE. If you are now lost, I will explain that if you dump a normal Hi-res screen to a printer without any magnification the screen image is dumped on the paper but there is no way of increasing its size without resorting to the use of a program like ZOOMGRAPHICS. The problem with a program like ZOOM GRAPHICS, (and this is not to say ZOOM GRAPHICS is a bad program, quite the contrary), is that any increase in magnification reduces the resolution. With a GRAFFILE it is possible to write and fill a whole sheet of 8 x 11 paper with an 8.5" graphic (or 14" if you have a 15" printer) and maintain the highest resolution.

The FONT EDITOR lets the user create fonts to upto a maximum matrix of 32 x 32 pixels or printer dots. Fonts can be either

proportional or mono-spaced. These fonts can only so far as I know be used within FONTRIX. Fonts can have up to 94 characters. There are facilities to edit the fonts supplied with the program.

In every section of the program there is access to disk allowing CATALOG, SEARCH for a file by wildcard, RENAME, DELETE, LOCK/UNLOCK, and see SPACE ON DISK remaining.

The PRINT GRAPHICS drivers are easy to use and allow for a normal screen dump or a Graffile dump.

The following Printers are supported:-

Apple.....	DMP and Silentype
Anadex.....	9000/9001 and 9500/9501
Centronics.....	122,739 and 358
Epson.....	FX-80, MX-80, MX-100
IDS.....	460,560 PRISM
C.ltoh.....	8510
MPI.....	88G
NEC.....	8023
Okidata.....	82A, 83A, 84,84 Step 2, 92 and 93

The following Parallel interface cards are supported:-

Apple PIC, and Centronics (also the Apple Super <u>SERIAL</u> Card)
ALS Printermate
CCS 7728
Epson APL/type 2
Mountain CPS
Microtek Dumping
Okidata Plug N Play (never heard of this one)
Grappler and Grappler Plus
Microbuffer II
Prometheus Versacard/PRT1/Graffiti
SSM AIO2/APIO/APPL
TYMAC PPC100

So I think most owners are covered here, I notice that Pkaso are missing from this list however. There is no mention of SERIAL PRINTERS. However in view of the Imagewriter's appearance on the market and the fact that the SSC is supported maybe the authors will add this in an upgrade.

The Fonts are all well done but one or two on the additional disks are a bit gaudy. Of the additional disks, Volume 1 has borders which are extremely versatile especially as you can use inverse as well as normal. There are Electronic symbols on Volume 2 as well as Floor Plan symbols and Music.

Are there any snags? I found that when a

A Selection of Fonts from the System and the additional disks.

This is Roman Font ABCDEFGHIJKLMNOPQRSTUVWXYZ

GREEK- Γ Π Ε Ξ Α Β Δ Ε Ζ Η α β γ δ ε ρ

algebra font $\Sigma \int \pi \frac{1}{2} \sqrt{e} \approx \pi \pi$

Script Font can be pretty and decorative

Old English is the best bitter.

PRIMER FONT abcdefghijk..

THIS IS ASCII BOLD abcdefghijklmnopqrst

ROMAN HEADLINE FONT 123456

and in contrast this is the SMALL FONT 1234567890 jk all these above are on the FONTRIX System disk, the examples shown below are on the additional disks.

THESE ICONS ARE
ARE ON VOLUME 2

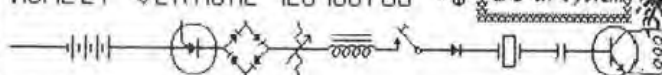
These fonts are on the additional disks at \$20 THIS IS "ASTROLOGY"

BANNER IS A
SIDEWAYS FONTBOOK FONT Book 123 abcdefghijklmnop
CHAPTER FONT 123abcdefB
A
N
N
E
R
F
O
N
T

DIFFUSION FOLIO BOLD *\$+

FONTRIX FONT

HUXLEY VERTICAL 123456789 #

these patterns
are on system

ECHO

LATITUDE
PRESTIGE Lt.

CAESAR FONT

CELTIC FONT abcdefghijklmnopqrstuvwxyz

TITLE FONT 12345az

FONTRIX KUDZU

US Price is \$75.00 with each additional font disk at \$20.

Peter Trinder - 4th March 1984 *

GRAFFILE is open and the screen scrolls I had to wait while the previous screen was written to disk causing a minor delay. The solution that I use is BEAGLE Bros DISKQUIK which initialises the Extended 80 Column RAM as a drive in Slot 3. It will take 10 x 20 sectors which is about one page of 8.5" graphic. When I use FONTRIX this way the scroll is practically instantaneous coupled with DISKQUIK's squelch sound as it is written to RAM! (You can turn this off if it offends). The second improvement that I have made is to boot-up Pronto-DOS which helps cut down the time changing from one section to another. I haven't installed a fast-DOS on the disk but copy it and try. DON'T DO IT ON THE ORIGINAL!

Otherwise I am very satisfied with this program.

//e Input Routine

by Michael Tickle

In response to the cry for help sent to the Letters Page, here is my //e Input Routine.

VC% is horizontal tab.

VG% is GET if set to 1.

VG% is INPUT if set to 0.

VL% & VH% are ASCII code limits for figs or chars - whatever!

VTAB is VTAB pos.

VP% is //e equivalent of POKE 36,N and can be set to 36 if not //e.

I2 is length of string.

220 is Backslash - start again.

255 is Del. 1 char.

This routine is still a bit messy round the 79-82 chars but the string is what it says and the loop increases and decreases correctly.

```
50 AS = "": FOR I = 1 TO I2
52 POKE -16368,0
54 WAIT -16384,128
56 K = PEEK (-16384):K1 = ABS(K-128)
58 IF VG% THEN I = 255: NEXT :
   VG% = 0: POKE - 16368,0: RETURN
60 IF K1 = 13 THEN I = I2: NEXT :
   POKE - 16368,0:I% = 0: RETURN
62 IF K = 220 THEN I = I2: NEXT :
   VTAB VT%: POKE VP%,VC%:
   FOR I = 1 TO LEN(AS)+1:PRINT " ";:
   NEXT : I% = 0: GOTO 50
```

```
64 IF K = 255 AND LEN (AS) > 1
   THEN AS = LEFT$ (AS,LEN (AS)-1):
   I = I-2: GOSUB 82: GOSUB 76:NEXT
66 IF K1 > VL% AND K1 < VH%
   THEN AS = AS +CHR$(K1):GOSUB 74:
   NEXT : POKE - 16368,0: RETURN
68 I = I2: NEXT : GOTO 50
74 IF VC% + 1 = 80 THEN I% = I:
   VQ% = VT% + 1
76 IF I% THEN VTAB VQ%: POKE VP%,0:
   PRINT RIGHT$ (AS,LEN(AS)-(I%-1)):
   CHR$ (95): RETURN
78 VTAB VT%: POKE VP%,VC%:PRINT AS:
   CHR$ (95);" "
80 RETURN
82 IF I% THEN IF VC% + LEN(AS) <=80
   THEN I% = 0:VTAB VQ%:POKE VP%,0:
   PRINT " "
84 RETURN
```

How it's used.

```
10 GOTO 100
50 AS = "": FOR I = 1 TO I2
52 POKE -16368,0
54 WAIT -16384,128
56 K = PEEK (-16384):K1 = ABS(K-128)
58 IF VG% THEN I = 255: NEXT :
   VG% = 0: POKE - 16368,0: RETURN
60 IF K1 = 13 THEN I = I2: NEXT :
   POKE - 16368,0:I% = 0: RETURN
62 IF K = 220 THEN I = I2: NEXT :
   VTAB VT%: POKE VP%,VC%:
   FOR I = 1 TO LEN(AS)+1:PRINT " ";:
   NEXT : I% = 0: GOTO 50
64 IF K = 255 AND LEN (AS) > 1
   THEN AS = LEFT$ (AS,LEN (AS)-1):
   I = I-2: GOSUB 82: GOSUB 76:NEXT
66 IF K1 > VL% AND K1 < VH%
   THEN AS = AS +CHR$(K1):GOSUB 74:
   NEXT : POKE - 16368,0: RETURN
68 I = I2: NEXT : GOTO 50
74 IF VC% + 1 = 80 THEN I% = I:
   VQ% = VT% + 1
76 IF I% THEN VTAB VQ%: POKE VP%,0:
   PRINT RIGHT$ (AS,LEN(AS)-(I%-1)):
   CHR$ (95): RETURN
78 VTAB VT%: POKE VP%,VC%:PRINT AS:
   CHR$ (95);" "
80 RETURN
82 IF I% THEN IF VC% + LEN(AS) <=80
   THEN I% = 0:VTAB VQ%:POKE VP%,0:
   PRINT " "
84 RETURN
100 HOME : PRINT "input routine"
110 VC% = 0:VG% = 0:VL% = 64:VH% = 91:
   VT% = 11:VP% = 140:I2 = 255
200 GOSUB 50
300 PRINT AS;" " : LEN (AS)
1000 END
```

GOT A FUNNY DISK?

... WANT TO KNOW MORE ABOUT IT?

Then you
need the



(Confidential
Information
Advisors)

CAN YOU ...

- * edit normal or protected disks?
- * quickly find and recover any intact file, however badly the disk is corrupted?
- * list programs directly from any disk - protected or not?
- * examine textfiles directly from any disk - protected or not?
- * analyse the formatting of normal or protected disks?
- * decrypt commercial software - or encrypt your own?
- * rapidly auto-search normal or protected disks for anything you like?
- * understand & use the latest copy protection methods?
- * use your Apple as a powerful document retrieval system?
- * make use of an exhaustive knowledge of disk lore?

YOU CAN NOW — with a little help from these 5 sophisticated disk utilities:

TRICKY DICK examines, records, deletes, and edits. It can: (1) read individual sectors from protected disks, (2) list their contents in BASIC, assembler, ASCII, or hex, (3) edit them, (4) write them back to the disk. Tricky Dick cunningly bypasses most protection systems, allowing you to work on disks with nonstandard formatting, half-tracks, and altered DOS marks. It is also a chief executive program that directs the following undercover agents:

THE LINGUIST reads in a trackful of raw data for your scrutiny, translates all the address information, and allows you to inspect the tracks' formatting. It also translates all 3 types of DOS encoding (6 & 2, 5 & 3, 4 & 4), and works with Tricky Dick to list and examine programs or textfiles on any protected disk. Use The Linguist to recover valuable files from blown disks, improve your programming skills by studying commercial software, and analyse standard or altered formatting.

THE TRACER rapidly searches normal and most protected disks for up to six strings of your choice simultaneously (specified in ASCII or hex). The Tracer also verifies disk formatting, and sniffs out all hidden catalog or VTOC sectors. When it finds something, it transfers control to Tricky Dick and puts the cursor over the object of your search. A few further keystrokes allow you to make any necessary changes and write the sector back to the disk.

THE CODE BREAKER keeps your programs and textfiles from prying eyes by enabling you to translate them into a "secret code" during disk storage. This utility also decipheres encrypted

commercial programs, allowing you to use Tricky Dick to read, list, and edit software never before accessible to any disk utility.

THE TRACKER closely shadows the disk drive arm, carefully recording all its movements and operations. The Tracker's job is to display, on either your screen or printer, a list of every track and sector accessed during a LOAD, RUN, SAVE, or any other DOS operation. This utility also tells you exactly where a read or write occurred during any disk access. Use The Tracker's services to locate the precise trouble spots on a clobbered disk, to determine sector skew patterns, to discover the location of hidden "bubble-count" tracks on protected disks, and to learn much more about how DOS works. You'll be surprised to see just exactly where the disk arm really does go!

What's more, you get permanent access to:

THE CIA FILES A 50,000+ word book designed to turn you into a disk expert. In addition to complete instructions for the 5 CIA utilities, the book contains an easy-to-follow hand-holding tutorial (written in plain English!) on all aspects of the Apple disk. Using the CIA utilities as your personal guides, you progress step-by-step to total disk mastery. You'll acquire a wealth of skills and information relating to disk repair and file recovery, DOS patches, copy protection, disk formatting, program encryption, and other vital topics. Much of the material has never before appeared in print.

All programs are unprotected, and hence can be copied, listed, and modified at will. They require one drive, DOS 3.3, and 48K of RAM.

TO GET THE CIA ON THE TRAIL OF YOUR DISK, SEND £35.00 TO:

GOLDEN DELICIOUS SOFTWARE LTD. (Sales Dept. B5)
7 Sloane Avenue • London SW3 3JD

Education

by Norah Arnold

THE LOGO TOOL KIT

Two new LOGO disks are now available from the software library. The first of these is the LOGO TOOL KIT, and it is a very useful set of procedures. First of all I must make it clear that it is for Apple Logo only, indeed a few of the "tools" are already available to Terrapin Logo owners on their Utilities Disk.

The second disk contains a set of sample Logo programs. The documentation for both disks will be placed on the back of the Tool Kit disk and can be printed out easily from a menu which appears on booting the disk. The two disks will be sold together as "The Logo Tool Kit" and will cost ten pounds.

What will you get for your money? Here is a brief summary of the contents of the Tool Kit disk.

1. Handy Little Tools.

SORT: sorts numbers in a list.
REMARK: lets you add comments.
SET.TOOLS: implements set operations such as INTERSECTION and UNION.
ERPROPS: erases user properties.
PLOTTING.TOOLS: for graphing equations.
LOOPS: gives you FOR, WHILE, UNTIL and FOREVER.
NUMBER.TOOLS: some numerical operations.
GRAPHICS.TOOLS: gives new turtle commands.
MAP.TOOLS: allows a function to work on a list of inputs.

2. Printing and Saving Pictures.

The PICTURES program allows you to SAVE a turtle graphics picture on a disk and to view it again later.

The LOGOGRAPH PRINT UTILITY enables you to print pictures on many different printers. LOGOGRAPH covers the following printers and works with many popular interface cards:

EPSON: MX-70, MX/FX-80, MX-82, MX-100.
 STAR MICRONICS: GEMINI 10, GEMINI 15.
 INTEGRAL DATA: 460G, 560G, PRISM 80/132,
 MICROPRISM 480.
 CENTRONICS: 739, 122, 352, 353.

ANADEx: DP-9000, DP-9001, DP-9500, DP-9501,
 DP-9620, DP-9xxxA.
 C. ITOH 8510, 1550.
 NEC PC-8023A-C.
 DATASOUTH DS-180.
 OKIDATA 82A, 83A.
 SONY SM 7020.
 APPLE DOT MATRIX.

(Some of the above need the appropriate graphics option in order to handle graphics.)

There are also a set of procedures for printing from inside LOGO for owners of the Silentype printer, and those who own Grappler or Pkaso interface cards.

This group of tools are very helpful. Those set-ups I have been able to try the printing tools on have worked beautifully, although obviously I have not been able to test the routines for all of the printers listed.

3. Logo for the youngest child.

This version of the program TEACH allows young programmers to create drawings by trial and error and have the result retained as a procedure without having to recreate the sequence of commands in the Editor or by using TO.

4. A Text Processor for Children.

TEXTPRO gives a child an easy introduction to text editing and formatting. This program was designed with classroom use in mind.

5. Making Music In Logo.

This package allows simple tunes to be played using the Apple's built-in speaker.

NOTE: input in the form of an integer.
PLAY: input in more or less standard notation.
COMPOSE: notes can be played on the keyboard and remembered. Three complete octaves are accessible directly from the keyboard, including all the sharps and flats. The range of octaves can be raised or lowered.

6. Using Plotters from Logo.

The Tool-Kit contains procedures for interfacing the Houston Instrument HIPLLOT (DMP-7Y), and for the Radio Shack 4 colour Graphic printer (CGP-115).

7. Graphics Aid.

These procedures enable the user to access the Apple's LO-RES graphics from Apple Logo.

8. Debugging Tools.

These procedures give the user the ability to STEP and TRACE.

9. Input and Output.

PRETTYPRINT: Allows you to print procedures and lists that have lines longer than the width of your printer in a tidy fashion.

FANCY.CHARS: Gives inverse, flashing or normal characters. **CLEARTEXT** inverts whole screen in **INVERSE**.

TEXTLOAD: Sets Logo so the text in procedures used for saving text is not saved by Logo.

GR.SWITCH: Allows things to be drawn without being seen, so they can be displayed all at once.

IBM.8TH.BIT: Disables the eighth bit, which causes some printers to print graphics. Useful for some IBM printers.

10. A Logo 6502 Assembler.

This program will allow the user to create and install new Logo primitives from 6502 assembly language source code. Like the Terrapin Logo Assembler this assembler is written in Logo.

11. Floor Turtles.

The procedures in this section help in interfacing Apple Logo to a floor turtle such as the Terrapin Floor Turtle.

Both the Tool-Kit programs and the programs on the Sample Programs disk were collected together by the Washington Apple Pi. The documentation is very thorough. Indeed the only snag I have found with the whole package to date is the slowness of printing out the documentation when I was eager to get on with trying out the procedures.

I cannot vouch for the quality of all the programs on the Sample Programs disk. Some have well known names such as 'Hanoi' and 'Lunar Lander', and there is also one called 'Dynaturtle' which will ring a bell with Terrapin owners. I have not tried every program on the disk owing to pressure of time, but I am sure that the two disks together are certainly worth the ten pounds.

Don't delay, send off for your Logo Tool Kit to-day and have fun!

Local Groups

Hants and Berks Group.

We have a meeting on 9th April when Mackintosh will be there. We will also be having an extraordinary meeting. For further details, please ring Fran on Bracknell (0344) 444111.

We meet at Reading University.

Other addresses:

Herts Group meets at:

The Old School
1 Branch Road
Parkstreet Village
St. Albans

Avon Group meets at:

The Woodborough
Winscombe

South London Group meets at:

Raynes Park Methodist Church
Worples Road
Raynes Park

Birmingham Group meets at:

Pool Farm Boys Club
Hillmead Road
Kings Norton

Kent Group is peripatetic.

Check with Jim Panks on (0473) 371111
or with Doug Hendry on (0473) 441111.

Croydon Group's last known meeting place:

The Shirley Poppy
Wickham Road
Shirley

Check with Paul Vernon on (0181) 441111.

Lonely Apples

Mrs. Chellappah would like to meet other Apple users in the Runcorn area. Her number is (01928) 333333 (working hours) or Runcorn (01928) 333333 (out of working hours).

Literature Library

The literature library contains books on basic programming, logo, graphics, DOS and also technical manuals, many of which have been reviewed in Hardcore. We also keep various user group magazines from Europe and the U.S.A.

These are usually taken to national meetings and can be viewed there. Should you wish to borrow anything from the library you would have to either pay the return postage or return them at the next national meeting. We would ask that you do return them promptly as not doing so deprives other members of this service.

Membership

You may have noticed that the database has undergone a minor change which has been to change the renewal date from American to English format, therefore SUBS DUE: are now DAY/MONTH/YEAR. I hope that this will avoid the confusion there has been recently.

Courses

Visicalc Beginners Course.

On Saturday 14th April there will be another Visicalc Beginners Course at the Ladbroke Mercury Hotel, Bracknell, Berks. The Speaker will be Fran Teo. The cost will be £25 for members, £30 for non-members incl. VAT. If you haven't already booked, do it now!

Card Survey

We would like to do a survey of printer cards. There are a great many available and obviously few people have more than one, so it is not easy for someone to write a comparative survey. We are therefore appealing to you to provide the answers to the questions below for your card. Although these are not direct questions, they give the areas in which we are particularly interested, the starred areas being the most important. Even if yours is a commonly used card, please let us know what you think of it.

- * Name of the printer card?
- * Manufacturer?
- * Price?
- * Parallel/Serial
- * Cable supplied?
- * Pascal/CP/M compatible?
- * Screen dumps - 40 column?
 - 80 column?
 - Lo-res?
 - Hi-res? If yes,
 - Which printer?
 - Rotated?
 - Scaling?
 - Different densities?
- * Compatible with other cards?
 - Bypass routines?
 - Transparent mode?
- * Buffered? If so, what size?
 - Manual? Good, indifferent, bad?
 - Special features?
- * Problems?

For Serial Cards:

- Min/Max Baud rates?
- Split Baud rates?

Wiring Diagrams

CCS Asynch. Serial Card

Quint Sprint 9

Quint Sprint 12/20 (serial)

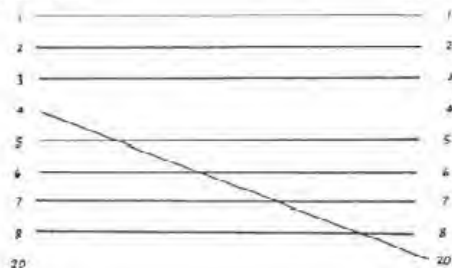
Epson 8143/8145 Serial 1/f

CCS Card

Printer

DB-25 Male

DB-25 Male



INTERFACE CABLE

CCS Asynch. Serial Card

NPR 8000 series (serial)

Quint Sprint 11 (serial) *

Hermes 612C

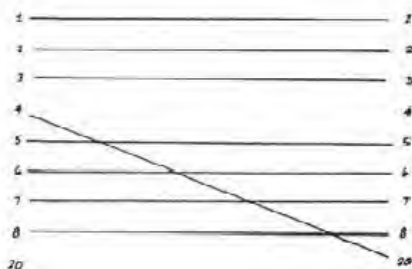
(* make up a short (1ft. long max.) crossover lead)

CCS Card End

Printer end

DB-25 Male

DB-25 Female



CCS Asynch. Serial Card

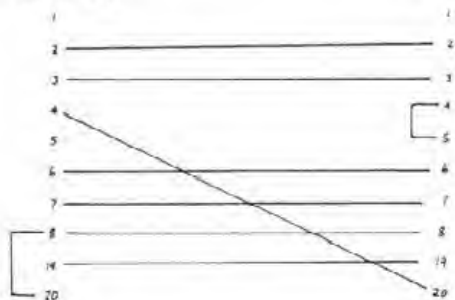
Facit 4420/4430 VDU

CCS Card

VDU end

DB-25 Male

DB-25 Male



CCS Asynch Serial Card

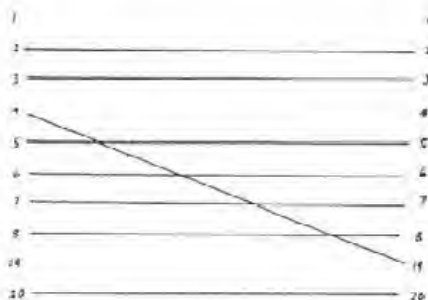
Facit 4510/4512 (serial)

CCS Card End

Printer end

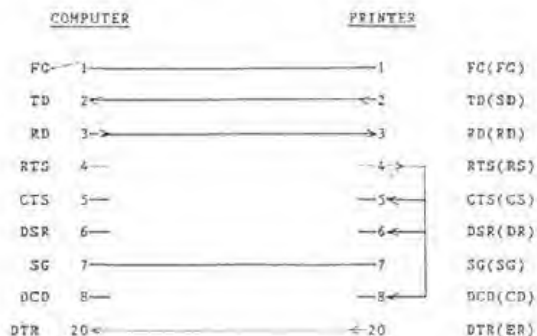
DB-25 Male

DB-25 Male



BROTHER Cable

Type: A-4



ALTOS, APPLE II (ORIGINAL CARD, SSM 4510), OSBORNE (MODEL 01), PHILIPS (P 2000M),
 SUPERDRAIN, APPLE II (CCS 7710)

↓ To Brother HR15, HR25 etc.

Editing on //e

Software Wanted

EDITING BASIC PROGRAMS ON THE APPLE//e

By Peter Trinder.

The Editor tells me that some of our members who have recently bought their Apples are having difficulty in understanding how to edit a program on the Apple //e. I think that probably where people are going wrong is that in the 40 column mode (without having the 80 column firmware turned on) the cursor is always a chequer-board pattern.

To edit in the 40 column (80 not active) mode, first LIST the line. Then press Escape and move the cursor up to the line either using I (UP), J (LEFT), K (RIGHT) & M (DOWN) or the appropriate ARROW keys - either way place the cursor over the linenummer then PRESS the spacebar ONCE. (This exits the Escape mode and the cursor can then copy over the line, correcting any errors.) It must go to the end where you then press return.

If you have the Apple 80 column or the 80 col. extended card then you can edit in 40 or 80 columns. There are 2 cursors in the 80 column active mode. A solid cursor which is the normal active cursor and a cursor with a plus sign. Now turn on the 80 column card with a PR#3 (it won't destroy your program) then you have the choice of edit in 40 columns or 80 columns. For 40 press Escape 4, to return to 80, press Escape 8.

Now if you list the line you want and then press Escape you will get a cursor with a plus sign in it. Move the cursor up to the line then either press Escape or Spacebar and the cursor will change back to a solid cursor. Copy over the line, correcting as you go.

It certainly is easier to correct lines with PRINT statements on the 80 column screen. You can still type POKE 33,33 then LIST the line(s). This will crunch up the line so that you don't copy over lots of spaces in the text and end up in a worse muddle, something I was always doing in my raw Apple days.

From time to time every micro user wants a piece of software that does not seem to be available. This column exists to detail what you are looking for, so that if any member knows of an appropriate program, the information can be passed on. So to set the ball rolling, here are a few needed items.

1. Dual column word processing.

A member needs to be able to edit software in two separate columns on the screen at the same time. Applewriter I divides the screen horizontally, but a vertical division is needed for the production of scripts. Details to Bob Raikes (0773) 331122(1).

2. A Large Database.

BASUG needs an easy to use, but fast Database for its membership records. A prime requirement is that multiple Data disks must be supported, but without all being on line at the same time. (Or has anyone got a hard disk system that they don't want). Offers to Keith Chamberlain (0111) 80 231(4). Hope springs eternal!

3. A program for helping compile Duty Rotas, or at least one that can calculate and sort in hours and minutes. Margaret Wood (c/o BASUG).

Please send in your ideas and pleas.

NOTE:

We have a NEW telephone number. You can now reach Fran on (0462) 811111 (0462) 811112.

Those of you who have ordered joysticks and not yet received them, do not despair. We are a little behind with them but they will be on their way to you very soon.

We also have Apple Orchard for January '84 for sale.

Please note: The cost of software library disks is going up to £5 from May 1st.

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
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- The built in communications software driver gives your Apple the ability to be used as a true interactive intelligent terminal to mainframe computers or communications facilities. Fully compatible with CCS serial cards and Apple communication cards etc.
- The Vision 80 typeface is of an attractive appearance and is highly legible due to its large 9 x 11 character font.
- It supports all Applesoft commands including the text Window ie Home, Text, GR, HGR, HGR 2, Tab etc. It has inverse and normal display ie Highlight and Lowlight in CP/M and Pascal.
- It is possible to change the cursor character to either a block cursor or an underscore cursor. The speed of cursor blink can be altered and it is also possible to re-define the character set with your own personalised font.
- The card comes complete with demonstration/ utilities disc and is simple to install. It also includes a comprehensive users manual.
- For use with Apple II+, IIe. Supports DOS, Pascal and CP/M Software.

£185 + VAT

VISION AWII

For users of the Apple Writer II word processor, the software on this disc automatically carries out all necessary preboot procedures to display Apples word processor output in 80 column format.

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The Vision 128/256 Ramcard is an inexpensive means of providing up to 256 Kilobytes of additional RAM main storage for the Apple II+, IIe. The card can be used as a fast scratchpad, supplementing the local storage of data arrays for application programs that can utilise this facility directly (eg. VisiCalc etc), alternatively with appropriate utility software support, the card can be 'masked' to appear as a fast disc storage unit. The Vision memory expansion is available as a basic 128K card which can be upgraded to 256K RAM as required. The card, which is fully compatible with the Vision 80, is fully buffered allowing lower power consumption and giving greater reliability. The card also features 6 L.E.D. indicators to indicate the current bank selected and read/write enabled.

£240 + VAT



VISION VCE

This preboot disc for use with the Vision 80 allows VisiCalc users to see a full 80 columns displayed on the monitor, it also makes use of the extra memory available in the Vision 128 (upto 143K in all).

£39 + VAT

VISION COMBO PACK

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Book Reviews

Title : Apple II: 6502 Assembly Language Tutor

Author : Richard Haskell

Publisher : Prentice Hall

Price : £30.81 incl. VAT (Book and Software)

reviewed by Dick Menhinick

This is an unusual publication. It may be described as:

- 1) a very good tutorial book with an equally good 'hands-on' software tutor, or,
- 2) a mind-numbingly useful piece of software with exceptionally good documentation!

Personally, in view of the rather high price for a book, I prefer to think that the second description is more in keeping with current values.

For £30.81 is a lot of money. You could buy two smashing games for that, a joystick, or a lockable disk box! I wonder what educational value any of these would have in comparison with Richard Haskell's book? Not much I suspect, for 'Apple II - 6502 Assembly Language tutor' is an excellent learning tool.

Learning tool for whom? It is for people like me who would really like to get to grips with programming in machine code but are 'too busy' to go on courses, and 'not patient enough' to learn from conventional books or Apple users who have been spoiled by the abundance of pre-assembled software tools, and who hesitate to spend a lot of their free time learning a new discipline only to find they have reinvented the wheel!

This book will not suit the absolute beginner. It gets too technical too quickly for that, but, for the accomplished 'Apple user' who has mastered the basics and the BASICS (!), a grasp of the inner workings of the machine can be yours for £30 - and a few evenings hands-on study!

The accompanying software is bootable in DOS 3.3 and 3.2 and consists of a machine level monitor displaying (in HEXADECIMAL) 88 successive memory locations, the contents of

all the registers, the program counter and stack pointer contents, and the contents of the status register (flags). A moving cursor indicates the address currently being examined, and a disassembly of the instruction immediately following the cursor is constantly displayed.

That doesn't sound too impressive until you start to use it to single-step through a portion of memory - the monitor ROM perhaps. Watching the flags and registers change with every new instruction executed soon gets the message across!

The book uses the monitor program to explain the instruction set and its effect on the machine status and registers. It begins with an explanation of the binary system, hexadecimal notation and conversions between decimal and hex/binary, before leading in to the registers themselves. Immediately you are encouraged to change registers using the software. It really is great fun - watching the flags change as the values in the accumulator are changed.. (simple things please simple minds - Ed.)

Having mastered registers, we are now led through the memory, discovering practically how to find our way round the machine with the monitor, changing locations as we go just for the hell of it! Then comes 6502 arithmetic - heavy stuff - but well explained and I now understand it!

The book goes through the whole sequence of machine language operations encouraging your participation at every turn of the page, and you soon find yourself whistling through at a pace. However, once you are feeling confident, the book really starts making you work - gently at first - on making good use of the techniques learned in the early chapters. It teaches you subtly how to place characters on the text screens, and how to write simple graphics routines, using bits of Applesoft ROM code to illustrate the points made (you single-step through these as you go).

Eventually you find yourself writing little routines to make 'bleeps' through the games port, and even designing your own peripheral cards and writing the driving software! The book tells all and you will amaze yourself at how easily you achieve your first wholly-original bit of assembly language

programming.

The real clincher as far as I am concerned, is that the software provided with this book is an extremely versatile and useful tool in its own right. It is first class for following the operation of a program or a monitor routine or one of the more convoluted parts of Applesoft! Long after the well-thumbed, dog-eared and solder-splattered book has been finally consigned to the darkest corner of your reference library, you will be using the monitor to debug your homebrew BCPL compiler or do-it-yourself 3780 emulator!

So, if you an ace machine code programmer who writes assembler in his head and rattles off pac-man variations daily, save your thirty quid and buy a decent joystick!

But for all us ordinary mortals this book could be the answer to a prayer and all for only £30.81!

Title : Fancy Programming In Applesoft

Author : Gabriel Cuellar

Price : £12.70

Soft cover, 6x9 inches, 245 pages

Publisher : Reston Publishing Company,
distributed by Prentice Hall.

Reviewed by Jason W. Smith

This book seems to have been written for someone who can already program in Applesoft BASIC and has a reasonable working knowledge of the language. It is for those who feel they want to write more "professional" programs in their particular fields, but cannot find the appropriate information in Applesoft and DOS manuals to help them.

The book has a total of 11 chapters each covering a specific topic in great detail. These chapters consist of:- Input, Output, Sorting, Files, Exec Files, The Screen, Text, Low Resolution graphics, Hi-res graphics, Sound and various utility subroutines. There are a total of 84 programs and subroutines in the book.

INPUT - This chapter examines the many problems that occur when using INPUT in programs and gives good solutions to all of these with a total of 15 listings dealing with problems ranging from "rejecting unwanted characters" to "INPUTing data while the program is busy". Some of these routines

have proved to be useful in the development of a data-base program that I am currently writing.

OUTPUT - Here, formatted output to the TEXT screen is dealt with, including the formatting of string, integer, and floating-point variables, so as to make the display look as neat and tidy as possible. It talks about "rounding numbers" in great detail and about formatting output with special characters, e.g. full-stops, dashes, etc.

SORTING - I found this chapter one of the most interesting, as it contained many different methods of sorting both numbers and strings. It even included a "binary search" program, which can be used to look for a specific item in an array and furthermore, quite quickly. The author also talks about "Tagfiles" and "Pointers" used in sorting, i.e. having two arrays with the same contents and a "linked-list" array respectively.

FILES - Both Sequential and Random Access files are discussed in this chapter. The author gives examples of using GET instead of INPUT when reading information from a Sequential file, and reading files of unknown length, etc. The section on Random Access files tells about finding the length of records, packing data, and includes a sample program for creating and reading Random Access files. Later on, the chapter explains MAXFILES, changing slot, drive and volume and turning off DOS to make more room in memory.

EXEC FILES - Many uses are shown for EXEC files in this chapter, the most interesting of which is a program which will scan a BASIC program for a string/character and when found replace it with the string or character of your choice.

THE SCREEN - This chapter generally talks about the screen "Soft-Switches" and the effects they have on the display. A table of beginning and end addresses is given for various TEXT/LO-RES and HI-RES screen pages. It is not too detailed.

TEXT - Scrolling the screen in 4 directions, changing the screen's attributes and various other delights are all discussed in this chapter. There is even quite a good text-editor program.

LOW-RESOLUTION GRAPHICS - It is first pointed out in this chapter that all the

scroll routines in the previous chapter can be used in exactly the same way with the Lo-res screen. A screen editor is available which allows you to draw and save your own pictures on the Lo-res screen.

HI-RESOLUTION GRAPHICS - Another editor, this time for Hi-res graphics, is given including transferring page 1 to page 2 and vice versa, multiple graphics pages, bit scanner (very powerful), negative Hi-res and more. Animation is the second section in this chapter and it covers the construction of Apple "Shape-Tables" in very great detail, finally providing a shape-generating utility. Page-flipping as an animation technique is explained. A method of putting 40 and 70 column character sets on the Hi-res screen without any extra hardware is shown, with various demonstration programs.

SOUND - This chapter starts off by telling you about the well-known "S=PEEK (-16336)" statement, but thankfully progresses on to higher things. The usual 21-byte machine-code routine is used to generate musical notes. (This is the only machine-code in the whole book, and is "POKED-in" from the "parent" BASIC program.) There is quite a good program which allows you to enter and save musical tunes. The author even talks about playing more than one note at a time in BASIC to produce harmony. The example given was reasonable, but because it was a bit slow I decided to compile the program, which gave quite satisfactory results.

UTILITIES - Boolean variables are discussed at length and useful "DEF FN" routines. Other topics are: creating hidden commands, hiding characters in the "CATALOG", relocation, having more than one program in memory, controlling the RESET key and many more equally interesting utilities.

CONCLUSION - Going by the current price of micro-computer books, I rate this one as good value for money. It gets to the point and explains clearly, without any unnecessary "waffle", the problem in hand. It really does have quite a wealth of information in it. The programs included actually contain no REM statements, but these are not necessary as a full description of each program is included beforehand. For the Applesoft programmer who wants to know more, I would say this is a book well worth having!

Title: Computer Literacy
Programming, Problem Solving,
Projects On The Apple
Authors: Warren & Bobbie Jones,
Kevin Bowyer & Mel Ray.
Price: £13.55
Publisher: Reston (Prentice-Hall)

Reviewed by John Bertle.

My overall feeling about this book is one of confusion. In some parts it is very good but in others very poor. The authors state that it is a book to use as an adjunct to hands-on work with an emphasis on this and also as part of a teaching programme.

There are 9 chapters dealing with everything from the physical layout of the Apple, the history of computers, programming through to the social aspects of computers in the home and industry.

The book must be aimed almost totally at the novice interested in computers but, in trying to cover a lot of ground, I think it falls down. The adage 'a little knowledge is a dangerous thing' applies, as some topics like high level languages i.e. COBOL are just mentioned and left. This is fine as literacy is surely at least knowing what words mean even if you do not use them, but it does however use Peeks and Pokes in the book - surely one of the most confusing aspects of programming to a novice - without giving a good insight into what they are, thus confusing rather than enlightening.

The problem solving and programming sections are good but again only up to a point. They start you off on a project and then leave you to your own devices. This is fine if you have either an instructor to assist in problem areas or the information contained within the text itself to enable you to fight your way out. If bought for home tuition you have neither. Frustration is the only answer. Few people would I feel persist in using this as a tutorial. Whilst on the subject of the tutorial aspect of the book, I cannot possibly see the point of setting review questions at the end of each chapter and then only answering the odd-numbered ones at the end of the book. Again if there is nobody to check the other questions the exercise seems futile.

As for the presentation of the book, it is generally good but again I think with an important criticism. There is an overkill of useless photographs showing what seems like

hundreds of people looking at monitors and other illustrations of dubious use other than padding out the page count which add up to a great number of pages which all have to be paid for.

Whether this book has been written for the home computer enthusiast I doubt, but as such I have to review it and I think it is one to be given a miss. If, however, any BASUG members have to run any computer literacy courses then it may well be worth looking at, if only to see how the Americans approach the subject.

Title: Programming the Apple II in Basic.

Author: Paul Tebbe.

Price: £14.40.

Publisher: Prentice/Hall.

Paperback: 23 x 15 cm (9" x 6") : 182 pages

reviewed by Dave Miller.

"The age of computers has come upon us with a speed that threatens to leave many of us spluttering in the dust. The rapid transition to computer assistance is developing anxieties in many people who have not, as yet, had a chance to learn about computers. This book, together with the Apple II personal computer, will replace computer anxiety with computer competence for anyone with the willingness to learn."

So 'Programming the Apple II in Basic' declares in its preface. It continues to go on about the need for students, business people, scientists and professionals to get to grips with computers and that this is the book to use. With this in mind the book was examined.

The book is split into sixteen chapters and two appendices. It contains example programs and exercises in Applesoft Basic. Its content seems very comprehensive but the book is only 182 pages in total. It works out at about ten pages per chapter with around four pages taken up with exercises for each chapter.

Chapter one is an introduction and deals with the three main units of an Apple system: the computer itself, the screen and the disk drive. Chapter two is a hands-on session. It is a good idea to suggest that the reader should use the computer to try out the commands dealt with in the chapter but to say "turn your Apple II computer on (consult your manual if you don't know how)"

is just not good enough. It is the book's job to instruct the novice reader on how to do this. There is nothing more demoralising than being unable to switch the computer on, or wondering why the disk drive light goes on and the computer stops responding to the keyboard or why the computer will not obey the commands given in the book but insists on printing out a '*' followed by strange numbers and letters. The chapter moves rapidly from HOME to PRINT using numbers, sums and letters. It then deals with arithmetic priority, significant digits and the rules for rounding up and down, scientific notation, errors, multiple statements on one line and the various languages used by the Apple. The chapter finishes with a one line program and some exercises. All in seven pages! Bearing in mind that the book is aimed at novices, I wonder how many will get past this chapter. I can see many just giving up.

The next chapter introduces basic programming principles but comes unstuck when it talks about variables: "Variables are used in programs... The first type is a REAL variable.. What IS a real variable? There is no explanation at all. I was just amazed when I first read this chapter. Having experience of trying to teach computer programming I know how hard it is for someone to grasp the concepts involved. If the reader gets past that then in the next page he/she has to grapple with a very strange explanation of the seemingly nonsense statement: 'X = X + 1'.

Chapters four and five introduce the simple use of DOS along with FLASH, INVERSE, NORMAL, SPEED= and the use of ',' and ';' with PRINT. Page 46 (just after chapter five) contains the 'Ten Commandments of Programming' which are not very profound: examples are "don't use reserved words as variable names", "spelling is important" and "don't neglect arithmetic priority". By the way, does anyone know what a reserved word is?

Chapters six to eight talk about strings and their associated functions, the IF...THEN construct and simple editing. Chapters nine to eleven deal with DATA, READ and RESTORE and one or two dimensional arrays ("bunches of variables"). Chapters twelve to fourteen deal with data files (both serial and random access) and using graphics. I think it is a bit much when an elementary introduction to graphics is called 'Graphing Techniques'. Chapter fifteen is called "'How to do it" Routines'

which seems to bear no resemblance to its contents: renumbering program lines, debugging and using a printer. The section on debugging is pitiful, mainly covering the use of TRACE. Chapter sixteen deals with subroutines and sorting. I think that subroutines are covered much too late and that sorting might be out of place in a book for beginners.

Appendix I contains the maths functions available in Applesoft. A more informative list is found in the Applesoft reference manual. Appendix II contains a list of the Apple's reserved words.

The example programs all work and are good although the cardinal sin of referencing GOTOS and GOSUBS to REMarks are rife. They do become slightly boring, mainly being of the 'read in data and then print them out again' format. I would have liked to have seen a more imaginative use of text and graphics, the latter hardly being used at all.

There are two major absences from this book which are unforgivable:

- a. There is no glossary.
- b. No structured programming techniques are covered.

I do not expect books on programming to go over the top on structured programming techniques but I feel that the novice should, at least, be encouraged to write down what he/she plans to do before trying to type in a program. Mr. Tebbe does not illustrate the process of constructing a program from some basic requirements. All that he does is to say: "to do so-and-so we might use the following program...". This encourages programming at the keyboard which is a sure way to spaghetti code. Mr. Tebbe only introduces subroutines in chapter sixteen and says that their use is only to save repetition of often-used segments of code. Only two out of around ninety example programs use subroutines and then it is to illustrate GOSUB and RETURN. The most important chapter, chapter two, is by far the worst. It is this chapter which determines whether the novice will have enough confidence to continue. The number of subjects covered and, hence, the speed of coverage could leave many readers lost and 'out of breath'.

The presentation of the book is good; a pleasant typeface is adopted while example programs are hard copies from a dot matrix printer similar to an Epson MX-80. I think

that this is a good idea since it does at least show that the programs have been typed into a computer. I only found one typo in the most unfortunate place: page 6 "If you receive a 'SYNTAX ERROR' or some other strange result, simply retype the command".

In summing up I feel that this book is badly planned. Important subjects have only just been touched upon and others are missing. The inclusion of sorting and random access files are totally inappropriate for a book of this level and the lack of a glossary is inexcusable. In my opinion it does not fulfil its title since programming is not only knowing what words of a particular language do what, but knowing the methods and techniques of how to construct well-structured code. These programming techniques are not covered. It certainly does not live up to the rather pompous preface and I would be surprised if business people or retirees would like this book. This book is not suitable for those who have never used a computer and who want to teach themselves from a book. The book could be effectively used by students on a computer course where it acts more as a companion than a tutor.

Exec Tip

Martin Rogers

In my previous article, BE AN APPLE EXECUTIVE, I promised you more applications for the EXEC command. Here is a useful patch which will overcome the bug in DOS which causes APPEND to corrupt sequential text files when they exceed 128 sectors in length. (This problem was discussed in detail in the August 1981 copy of HARDCORE)

```
CALL-151
B33E:18 AD BF B5 8D EC B5 6D E6 B5 8D E6 B5
AD C0 B5 8D ED B5 6D E4 B5 8D E4 B5 90 03 EE
E3 B5 60
3D0G
HOME:VTAB5:HTAB9:"< DOS 3.3 Append-fix
>":VTAB8:"This fix will patch DOS in
memory":?"to overcome the Append error on
files":?"that exceed 128 blocks in
length.":?
?:?"New disks Init'ed will contain the fixed
DOS.":?"Thanks to Call-Apple and BASUG.":
?"Re-boot to revert to normal DOS!!!":
VTAB23:HTAB8:" An M.C.R. Utility."
```

Watch this space for more exciting utilities! Even better, write in with any that you have developed which you would like to share with BASUG members.

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ACCESS WELCOME - SEND FOR CATALOGUE

Children's Software

We have had several enquiries as to why we don't review more children's software. We have tried to get hold of some packages but obviously we would love to have reviews from any of you that have programs at home.

Please have a go or get your children to do it!

Math Blaster (Apple version)

Published by Davidson & Associates
written by Janice G. Davidson, Ph.D. and
Richard K. Eckert, Jr.
Distributed in UK by Softsel
Price: £34.95

reviewed by Elizabeth Raikes

[Ed. This package consists of a program disk, a data disk and a manual, which is very comprehensive, and the whole package is nicely presented. It is designed for primary school children who are just getting to grips with the maths or older children who are slow and need practice to speed up.]

You can choose between addition, subtraction, multiplication, division, fractions & decimals or changing the data disk. I will talk about changing the data disk later. You can then decide what level you want to work at. Then you can choose from several activities.

The first activity is 'Look and Learn'. It shows you a problem, gives you time to guess the answer, and then shows the correct answer. You don't have to do anything - just look.

'Build your skill' gives a problem. You type in an answer. It gives you two goes to get it right. It times how long you take. I was slow at first, but then I got faster.

The next activity is 'Challenge Yourself'. You get a problem with a bit missing. You fill in whatever is missing.

The final activity is 'Math Blaster'. This is a game. Problems are put at the bottom and a choice of four answers at the top. You must make a little man jump up and 'burst' the answer. A sea-lion throws up a ball and you must get the answer before the ball falls back onto his nose. A balloon is falling towards a pin on the other side and

you must get the little man to push this back up when necessary or the game will end if the balloon is burst. I found this a bit fast. I could not cope with all these things at once. I am only five and a half so perhaps it will be easier when I am older.

If you need practice on one thing or have a 'blind spot' you can set up your own data file on an editor program. There is also a numeral recognition file for pre-school children.

I thought it was fun to use - much better than working through books at school.

Facemaker (Apple version)

Published by Spinnaker Software Corporation
Distributed in UK by Softsel
Price: £24.45

reviewed by Yvette Raikes

This is a pleasant package designed for 4 to 12 year olds. It helps children become comfortable with computer fundamentals such as: menus, cursors, the return key, the space bar, simple programs and graphics. It also helps improve a child's memory and concentration.

You can first build a face. This is menu-driven. You first select the feature you want, nose, ears, etc. Then you choose from a selection of these to make up your face. There are a wide variety of faces that can be made.

It is then possible to animate your face. There are several possibilities - wink, frown, smile, cry, stick out its tongue and ear wiggle. There is also a delay. You can type a list of the expressions you want (a simple program) and then watch your animations.

There is also a memory game. The face will produce several expressions and then you type in what you thought they were.

You can have sound to accompany the animations and can choose between a black or white background. This was very popular with my children and they picked up the 'computer fundamentals' extremely quickly.

Stickybear Basket Bounce

Published by Xerox Education Publications
Computer Software Division
From Optimum Resource Inc.
written by Richard Heffer, Janie and Steve
Worthington.
Distributed in UK by Softsel
Price: £28.75

reviewed by Yvette Raikes

This is a fun game which has kept my husband amused for hours! The object is to win as many points as you can by catching colourful, twirling, bouncing, falling objects - including bricks, doughnuts and stars - before running out of baskets. Stickybear holds the baskets. When you lose all your baskets, Stickybear is gently pushed off the screen by a monkey driving a bulldozer.

You can play on the keyboard or with paddles or a joystick. The package includes the disk, brief instructions (you don't need more), a cardboard cutout balancer to play with and some stickers. Despite the toys, it is for use by 3 to 99 year olds (presumably if you make 100 you have to give it up!).

Not exceptional, but amusing and the whole family will get enjoyment from it.

Small Ads

WANTED

Second-hand Apple II wanted.
Phone Peter Brunning (011-302) 310001.

I have a few Apple books which I would like to sell. They are:

Nibble Express, vol. III, pub. 1983 - was \$17.95 now £9.00.

Outstanding programs for your Apple by M Orphanides, pub. 1983 by Interface - was £5.95 now £2.50.

Enhancing your Apple II, vol. I by D. Lancaster, pub. by Sams, 1982 - was £13.55 now £8.00.

I also have a number of other books for other computers, especially the Spectrum, with some software. Anybody interested should give Peter Baron a ring on (011-302) 310001.

All items secondhand, but in virtually new condition.

Applewriter II+ £40
Dogfight £5

Peter Davies. (011-302) 310001.

I have recently changed my Apple II+ for a //e and now have some unwanted hardware for sale.

(1) Mountain Hardware Music System (18 months old, but never used in anger) £175.00 o.n.o.

(2) Snapshot II Hardware Copier for II+ only (bought from Windfall '83, used once) £65.00 o.n.o.

(3) II+ Colour Card (ancient but works a treat) £20.00 o.n.o.

Phone (011-302) 310001 evenings and weekends only and ask for Steve Crowther.

All items must be sold, so silly prices will be considered.

Apple II Europlus - full working order with books. £285.
Snapshot Copy System £25.

Peter Smith.

(011-302) 310001, (011-302) 310001, (011-302) 310001
Tel: (011-302) 310001

2 X Hires

Following his article in the last issue, Peter Trinder has sent in a source and binary program from Apple Orchard that illustrates another Double Hi-res display routine. It has been assembled on Bigmac (Merlin). This has been sent on to the Software Library.

Quick Tip

Where allowing the input of filenames, it is a good idea to put prefixes in front of the filename e.g. like TEXT. so that anyone entering a filename who doesn't know the limitations of DOS can enter what they like, including starting the filename with a number.

Visicalc Corner

TOWARDS AN OIL FIELD MODEL

By Gerry Corti.

When I invested in a computer - Apple, of course - it was with a clear idea of what was wanted from it. The development of Visicalc, a matrix based system, meant that at last I could test changes in inputs and variables at will, in oil field economic models, without agonisingly slow manual re-calculations or access to a mainframe computer.

Visicalc proved well suited. The logic of an oil field economic appraisal model, before tax, is no different from that of any capital investment appraisal. The principal inputs are:-

- Capital expenditure.
- Operating expenditure.
- Transport.
- Physical output.
- Price.

These are arranged in columns (with the rows used for years) and readily yield a net cash flow which may then be handled by the @NPV function to yield, after iteration, the minimised Net Present Value. As oil is denominated in dollars a barrel, an exchange rate column and a sterling net cash flow may be needed. Neat and simple, Visicalc comes into its own when it is desired to change any assumption, including those about future inflation rates, price changes or exchange rate. The Replicate function is tailor-made.

Yes, but what about tax? Now oil field taxation is a specialist sphere because there are several taxes. Corporation Tax most people are familiar with, royalty they can conceive of, but Petroleum Revenue Tax and Special Petroleum Duty (or advance PRT)? Well, the only sensible thing to do was to consult some experts, work out a flow diagram and re-consult the experts. The flow diagram is set out below as it would be for an oil field, being in the Southern basin of the North Sea, coming into production from 1986 onwards (which removes a number of complications).

FLOW DIAGRAM.

Revenue

1. Production.	Physical A
2. Price per ton/barrel	£ B
3. Gross revenue (A*B)	C

Expenses

4. Opcom.	D
5. Capex (135% uplift)	E
6. Interest.	F
7. Total expenses. 4+5+6	G
8. Net revenue. 3-7	H
9. Royalty.	I
	= (zero)

PRT liability

10. Allowances (4+5<135%>)	J
11. Oil Allowances £-10m. tons/year	K
12. Total PRT allowance (10+11)	L
13. Taxable base for PRT (3-12)	M
14. PRT at 75% (of M)	N
	= (zero)

CT Allowances

15. Allowances (4 + 5 <No uplift> + 6 + 9 <zero> + 14 <zero>)	O
16. Taxable base for CT (3-15)	P
17. CT at 52% (of P)	Q
18. Total Government Taxes (9+14+17)	R
19. Total company take (8-18)	S

It will be clear from the flow diagram that there is much derivation of tax allowances and tax bases from the primary inputs. It will also be pretty clear that there is a lot of interconnection. So Visicalc comes into its own even more here, because virtually every new column is now no longer filled with primary inputs but with derivatives, or with results modified by relationships. Equations govern the resulting values in the cells.

It took a long time and several attempts to get anything like a plausible model to show post-tax net cash flow and thus to be able to estimate post-tax NPV. Just about as this was completed I went on one of Fran Teo's advanced Visicalc courses and learnt how to construct a template. Thank goodness, because shortly thereafter the model had to be applied to a real life problem: the client had a share in an offshore oil field

which was about to receive development approval from the Secretary of State for Energy. So construct a template, then input the data.

The client was however going to finance the field in part by a loan. This loan would be secured on the oil to be produced and would only entail limited recourse to the client's main balance sheet (see the Finance of North Sea Oil, Corti and Others, HMSO 1978). How would the loan affect the respective return pre- and post-tax? Back to the drawing board; more equations; a test run; alter the template; re-run and "Yes, it looks OK".

The results are with the client and have been checked with experts from two of the major North Sea Operators. None of us can find any evidence that this sort of work has been done on a microcomputer using Visicalc so far. The models used by the oil companies are usually derived from their own mainframe models. Consultants are somewhat secretive but many of their models appear to have been formulated in the heyday of the mini. Most of us in the business have long had our own manual calculating routines, but here is the Visicalc result. The template is shown below in SS/S1 format. I claim the results as copyright, but BASUG members are most welcome to them for playing with, studying, correcting, educational purposes, and all non-commercial applications and uses. If any BASUG members are in the oil business and wish to employ the model would they please get in touch. If any BASUG members had already developed a Visicalc-based oil field model will they publish in Hardcore?

```
>AF1:"NPV POST LOAN POST TAX
>AE1:"NCF POST LOAN POST TAX
>AD1:"NPV POST TAX
>AC1:"NCF POST TAX
>AB1:"CT@52%
>AA1:"CUM.TAX BASE
>Z1:"TAX BASE
>Y1:"CT ALLOWANCE
>X1:"PRT@75%
>W1:"SAFEGUARD
>V1:"PRT LIABILITY
>U1:"PRT ALLOWANCE
>T1:"OIL ALLOWANCE
>S1:"CUM.ALLOWANCE
>R1:"ALLOWANCES(UPLIFT ETC.)
>Q1:"ROYALTY
>P1:"NCF POST LOAN
>O1:"LOAN REPAYMENT
>N1:"LOAN OUTSTANDING
>M1:"INTEREST
```

```
>L1:"LOAN
>K1:"NPV
>J1:"NCF
>I1:"GR.REV
>H1:"EXCH.RATE
>G1:"PRICE $
>F1:"TRANSPORT
>E1:"TRANS.PRICE
>D1:"OPEX
>C1:"CAPEX
>B1:"BBL/D
>A1:"YEAR

>AF2:@NPV(I4,AE3...AE16)
>AE2:(O2*365)-X2-AB2
>AD2:@NPV(I23,AC3...AC16)
>AC2:(J2*365)-X2-AB2
>AB2:(Z2*52)/100
>AA2:@SUM(Z3...Z100)
>Z2:(I2*365)-Y2
>Y2:((C2+D2+F2+M2)*365)+X2
>X2:(V2*75)/100
>W2:((-D2-F2+I2)*365)/((@SUM(C3...C100)*30)/100)
>V2:=(I2*365)-U2
>U2:R2-T2
>T2:20000*G2*365
>S2:((@SUM(I2...I23))*365)-@SUM(R2...R100)
>R2:=(C2+((C2*35)/100)+D2+F2)*365
>Q2:I2*.1
>P2:J3+L3-M3-O3-P3
>O2:J2+L2-M2-N2
>N2:L2+M2+L100
>M2:L2*.1
>L2:"M$/365
>K2:@NPV(I1,J2...J100)
>J2:C2-D2-F2-I1
>I2:B2*G2
>H2:G2/(1.5)
>F2:B2*E5
>E2:"BBL/P$
>D2:"M$/365
>C2:"M$/365
>A2:I900
```

P.S. Yes, there is a part of forward referencing that needs to be eliminated, and yes, there is actually a provision of oil taxation called Safeguard which can only economically be handled by Boolean logic.

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Communications

COMMUNICATIONS UPDATE

or

How NOT to run a Bulletin Board

The time seems about right to tell you the story so far with BABBS the BASUG Bulletin Board. As the board is sitting buzzing away beside me I feel fairly sure that it will let me write this article without blowing itself up!

Since my various articles on Bulletin Boards created considerable interest among our members the Committee decided to let me have my way and start one up.....No problem, not much.

The first, and ongoing, problem was software, Bulletin Boards have been the preserve of the US of A and there are literally hundreds over there, so naturally the software had to come from the States as they have had the experience. The first problem, having of course decided to use an Apple to drive the system, was to get software which did NOT use the Hayes modem card. Out of six software houses only two bothered to reply, and only one could offer software that was not dependent on the Hayes modem. This somewhat narrowed the choice!

The software was acquired on our behalf for evaluation and all the modules pieced together. When the system was fired up I must admit to being very disappointed with the results. Without going into long and painful detail, it was a pig to use, at least to my eyes. Having carried out an awful lot of research into the Bulletin Boards around the country (UK) I found the most popular and easiest to use were the TBBS boards running on TRS-80 machines. These boards are all menu driven, easy to understand and use and not only that, but the software is very powerful, allowing a great deal of flexibility. The other type of board around is the CBBS running under CP/M. Again, this is a very powerful (and cheap!) system, but user help is poor, giving little or no assistance, unless you ask for it, and consequently it took quite some time to get used to it.

The ABBS software looked very much like CBBS, but lacked the power and flexibility, dismayed we had to decide what we would do and having nailed our (my) flag to the mast

we decided that any Bulletin Board was better than none, and bought the software.

I think that locked away there is a message about buying the machine to suit the purpose rather than buying the software to suit the machine.

Anyhow Apple it is and now the hardware saga.....

Apple UK, bless them, gave us perhaps the last II+ made, and this was carried off to my lair in Sheffield, along with one of our excellent lower case chips. Disk drives are a pair of 8" double-sided Sorrento Valley Associates drives, giving 1Mb of on-line storage. The Serial card is the Apple Super Serial card, on long-term evaluation/loan from Pete & Pam Computers. Time is provided with my own Time Machine II clock-card, and keeping the whole thing cool is a home-brew fan. The modem started out as my home-built Maplin kit, with an Auto-answer board, designed by Ewen Wannop and nailed together by me. After about two weeks 'adjusting' it all worked and the Basug Apple Bulletin Board System was a runner.

All this happened in the weeks just before Xmas, and really quite a few people called it up just to see what was happening, but..... they were getting lost, pressed wrong keys, got chucked off and generally had a hard time. Deep gloom descended, the cat left home and my wife started writing articles for 'Hardcore'. Decision time was here again. Could I re-write the software? Should I re-write the software? Well, I reasoned that if we were trying to encourage modem communications then the software should be easy to use and by and large self-explanatory..... So I re-wrote the software.

BABBS is now a menu driven system with as many of the bells and whistles as I could add within the constraints of memory, full password protection and other fairly vital additions towards making a sensible system.

The problem now is that the program is quite large (32K) and with extensive String handling I have the frustration of needing more user memory, the task is beyond me but help is on its way.

The program works OK all the same, although it does seem to go away to carry out 'house-keeping' fairly often and it can't

hold as many files as I want, but it ain't bad. To overcome short-falls in the message count at the moment I have added quite a few SIG areas and these can be added to easily, so please USE THE SIG AREAS. Anyway the whole system will develop as time goes on and a much more efficient file-handling method is being looked into to allow much flexibility.

Having got all this programming over with, found the cat and spoken to my wife again, I reset the Board only to have the 'phone line hit by lightning four hours later! The cat promptly left home again!

Despair... A 'phone call to my insurers left me enough hope to order one of the new Minor Miracles WS2000 modems, complete with auto-answer and Auto-dial. This modem is new on the market and uses an exotic modem chip known as the 'AM-D', capable of most modes, including Bell tones. At £118.00 for the basic modem it seemed a bargain, and it is.

The modem is capable of CCITT V21 and V23 (300 baud and Prestel) plus Bell 1200 and 300 (Bell 103) and it can RECEIVE data from a Prestel type modem, all as standard. They are waiting for full BT approval at the moment, so I recommend any-one at the 'wondering' stage to get an order off soon as the price is going up about £30.00 soon.

As the Auto-answer has not arrived yet I have no idea how good that part is and the same goes for the auto-dialer, although I have high hopes that the Hayes modem software may work with it. More on that in the future. As the Auto-answer module has not arrived the Bulletin board is being run through a DACOM modem lent to us by Pete & Pam, who very kindly offered it to us without any soliciting at all. I find that very generous. Thank you very much, 10 out of 10.

As my new modem will handle Bell tones I have decided to switch the BABBS to Bell tones from midnight to 9 am as I think we may attract some American users on the board which could prove interesting, plus there are some users in the UK who only have Hayes modems and there is only one other International Bulletin Board in the UK.

On the subject of American Bulletin Boards, BASUG has enjoyed a good relationship with the Washington Apple Pi group in Maryland

for some time and they have agreed to allow those of our number with the modems and the pockets to call the States to access their Bulletin Board.

The number is: 0101-301-986-8085
Instructions: On contact enter a Carriage
Return then ->
Response will be :
WAPNNN.PSWD or WPNNNN.PSWD
You type: WP9998.ERII <RETURN>

And off you go - However Tom Warrick (Sysop) says that everyone using that pass will be recognised as the same person and please don't overload their board with calls (honestly!).

Please call between 5 am and Noon (Greenwich time).

This may all seem to be over the top for lots of you but at the same time it does establish a further link in the World of Appledom. So far BABBS has had callers from Germany, Denmark, Norway, Finland, Holland, France, Austria and Australia.

That's it for this issue, except to record my thanks to:
Steve Holmes, Len Gould, Ewen Wannop, Peter Tootil, Andy Holderness, Pete Fisher, David Ormerod, 'The Committee' and of course 'The Other Woman'.

Ed. It may be of interest to you to know that this article was transmitted via modems direct from Sheffield to me in order to meet the copy date.

MEMBERSHIP LISTS

We often get requests, especially from new members, for a membership list to be published. Those of you who've been members for a while will know that the decision not to publish names and addresses was made at a previous AGM and was subsequently endorsed at the next AGM. If somebody feels strongly that a list should be published, perhaps they could make a formal proposal along these lines for discussion at the next AGM.

Printers

Dot Matrix Printers.

by Bob Raikes

This issue has a particular leaning towards printers. The Editor has 'asked' me to write a short introduction to the kinds of printers available for the Apple.

Printers can be divided into two distinct types. These are those printers that work by impressing on to the paper an image of the letter or symbol required. In order to print a complete alphabet, an image of each letter has to be available, and the current 'state of the art' is the daisy-wheel printer. This will be the subject of an article in the next issue.

The other kind of printer is the 'matrix' printer, so called because it can make up any character from a pattern of dots organized in a pattern of rows and columns like a mathematical matrix as characters are made up on the Apple screen. For example:-



a

The dots can be produced by a number of different methods. The most common are:-

1. Impact.
2. Thermal transfer.
3. Spark.
4. Ink jet.
5. Laser.

Impact printers use a ribbon, and the dot is produced by a needle in the print head being thrown forward by a tiny electromagnet against a ribbon which is held against the head, a small distance from the paper. The momentum of the needle forces the ribbon into contact with the paper, and a trace of ink is left. Behind the paper is some form of support, either a roller or a metal bar, and the needle bounces off this and back into the head. On most impact printers there is an adjustment to move the print head back if thicker or multi-part paper is used. This is necessary as there must be enough of a gap between the head and the paper, for the needle to reach a high enough speed to leave a good mark. Common printers of this type

include the Epson MX, RX and FX range, the Apple DMP and Imagewriter, the Stars and Shinwas.

Thermal transfer printers use specially treated paper or ribbons. The paper is coated with a chemical treatment which is very heat sensitive as in the Apple Silentype. Small points of heat are produced on the print head which either discolour coated paper directly, or plain paper is used with a special ribbon. In this type, the heat from the head causes ink to be transferred from the ribbon to the paper. Because the system relies on very close contact between the head and paper, extremely smooth paper must be used to give good quality results. The Brother EP22 & 44 can use either thermal paper or ribbons.

This is a test of the Brother EP44 Thermal Printer.
Thermal paper is being used.

This is a test using a Thermal ribbon and good quality plain paper.

Spark printers (such as the Olivetti, Sinclair printer) use special conductive paper. A high Voltage is applied to a point on the head, and a spark arcs across to the paper, burning it. This leaves a mark.

Ink Jet printers use liquid ink. The head contains an extremely fine tube in which the ink is retained by capillary action. This tube is vibrated at a particular frequency, causing a 'standing wave' to be formed. This divides the tube of ink into individual droplets. As with spark printers, a high voltage exists between the head and electrodes near the paper. The drops of ink are propelled to the paper and guided by the electrostatic force. This is one of the technologies that may become more important as time goes on, especially if and when demand for colour printing increases. One of the problems encountered with impact colour printers is that the (very expensive) colour ribbons can become quite 'muddy' very quickly, as traces of the darker colours which have come off on the head and pins are transferred to the lighter colours. The ink Jet solves this problem.

Laser printers are gradually getting cheaper, however it is not likely that they will be on the micro market for some time to come.

Impact Printers.**Pro****Versatile.**

Cheap to run.

Any paper usable (including labels).

Fast (over 500 c.p.s. is possible).

Colour available.

Well supported by software.

Carbon Copies available.

Wide variety of fonts/ styles.

Widely available.

Con

Print Quality is limited.

Can be (very) noisy. (Never buy an impact printer without hearing one in operation).

Can be bulky.

Thermal/Thermal Transfer.**PRO**

Silent.

Compact.

Can be battery powered.

Cheap.

Quality can be very good.

CON

Special paper required.

Paper expensive.

Paper can fade.

Can't print labels.

Slow.

Max 80 columns.

Ink Jets**PRO**

Silent.

Can give reasonable quality.

Excellent for colour.

CON

Ink capsules can be expensive.

Slow.

Jets can clog.

Characters can spread on some papers.

Can be uneven.

Only suitable for a limited range of environments.

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Software Library

by Jim Panks.

HELP WANTED!!!

Until now the Software Library has been run by one person. Well, now the number of new sections and the large amount of work has made this impossible. To try and keep the standard of this vital BASUG facility, it has been decided to organise a SOFTWARE SERVICES GROUP.

This entails the formation of a group of members co-ordinated by the current software librarian. We hope to encourage members interested in software but not in the day to day running and/or committee work, for which the software librarian is responsible, to join. I propose that this group works in an informal but organised way, i.e. the work involved would be allocated to members on a job to job basis and the amount of work done would be decided on by the member.

Various jobs need doing and some of these are fairly urgent and important. These jobs can be split into 4 main categories:-

- 1) The reviewing of software for the software catalogue.
- 2) The appraisal of software for inclusion in the Library.
- 3) The repair/de-bugging of existing software and entry of new public domain software.
- 4) The proof reading of manuals and the assessment of Special Release Software.

The rewards are not great - on the same basis as writing for Hardcore - but in many cases you will be able to keep the disks you work on.

If you feel that you can devote some time and energy to a very important area of the club then please contact me with the type and amount of work that you can undertake and remember the more members that help, the less each person will have to do and the more the quality of the service will improve.

Readers' Letters

Wareham, Dorset.

Dear Sir,

Could you direct me to information on the use of hardware interrupts on the Apple II+? Although I have been able to use interrupts generated by a 6522 VIA and the interrupt service routine (written in 6502 assembler) works O.K., I get problems when running basic programs. The hardware interrupts occur at 1 minute intervals and allow the Apple to take readings from laboratory equipment. At the same time the Apple is executing BASIC programs. The problems occur when syntax errors are reported, usually FOR loop variables undefined or array dimensions outside permitted values. This occurs with programs which are fully debugged.

The interrupt service routine uses locations \$95FF to \$9200 with HIMEM set at \$91FF. The only other locations used are \$0305 to \$0355 and FF,FE in page one.

I would be grateful for any light which you might throw on this problem.

Yours sincerely,

W. House.

Wallingford, Oxon.

Dear Editor,

I noted Phil King's letter about "double-siding" disks in the February magazine, and thought that the following comments might be of interest.

The material the disk is manufactured from is double sided, but the surfaces will be certified in the following way on soft-sectored disks:-

Quad density - will record at 96 tracks/inch
Double density - will record at 48 trks/inch
Single density - less than 48 tracks/inch

In addition, the disk will be certified as

double or single sided. The inner surface of the sleeve usually contains a special cleaning fabric which is orientated to the rotation of the disk. So, if you use the bottom surface of a single sided disk, the disk will be rotating against the orientation of the cleaning fabric, and may cause excessive wear on the surface of the disk, and deposit oxide on the disk heads. Whilst it is feasible to use both sides, I would only recommend using the second side to hold a back-up copy of what is on side one.

Yours sincerely,

Chris Murphy.

Hampstead, London NW3

Dear Madam,

In reply to Phil King's letter (Hardcore Feb 84), there are a few reasons for not using two sides of a disk.

1. To quote from Beagle Brothers Utility City Documentation (Apple Tip Book #3): "When you use the 'wrong' side of a disk, it spins the 'wrong' way, and can mess up the friction pad (or whatever it's called) inside the disk itself. This is potentially a b-i-g problem and our good friend, Pete the Pessimist, says you can mess up not only the disk but your DRIVE as well! Pete also refuses to go outside of his closet without a hard hat."

2. You should also really use specified double sided disks as single sided disks are often (so I read) double sided rejects - this is easily countered by using a disk surface verifier (such as is found on Locksmith and the like) before using that side.

I do not know how much of the above is true or just hearsay (perhaps started by disk manufacturers). I, however, half-believing #1, only save my back-ups (which I hardly ever touch) on two sides.

I hope this has shed some light on the subject.

Also, does anybody know of an equivalent book to Beneath Apple DOS, only for

Applesoft?

I am looking for a routine I can use so I can write lower case within quotes in Basic (that is besides the expensive PLE-like programs - I'm a poor student).

Yours faithfully,

Ian Sidwell.

/Ed. The book you want is probably 'All about Applesoft' which is one of the Call-A.P.P.L.E. In Depth series. There is a lower case routine in the Software Library - disk no. 82./

Flitwick, Beds.

I am using an Epson and a //e and I have a problem turning off underlining using CHR\$0 on the Escape codes. Please can anyone help?

John Rodger.

Saint Peter's-in-Thanel, Kent.

Dear Sirs,

Regarding Peter Trinder's article on the Gutenberg system (Vol. 3 No. 6), what are the differences between the Junior and Senior versions (besides pictures and only one printer driver) ... so can one also have italics, Greek and Cyrillic sets, superscripted numbers and vulgar fractions with the Junior version as well as the Senior version? (Incidentally, I have an Apple //e and DMP.) Also does one have to contact the given Canadian address, or is there a UK outlet?

Also is there any way that I can get italics, Greek and Cyrillic sets, superscripted numbers and vulgar fractions using Applewriter //e and the DMP? the reason for asking is because I understood that I would be able to download such character sets when I bought my Apple system.

Many thanks.

Yours faithfully,

Seth Proctor.

/Peter Trinder replies: The Junior version will give you these options but not all of them can be downloaded directly. The Senior version is rather better. Although there is also an outlet in the U.S.A., there is none in the UK at present. There is no simple way to get the character sets you want on Applewriter //e./

Hertford, Herts.

Dear Hardcore,

Does anybody know how to make a PRAXIS 35 typewriter work with an Apple II? Please phone me on 0442 31133.

Jim Steel.

Chinnor, Oxon.

Dear Yvette,

The magazine is very interesting but I am sure that it would be enhanced if there could be more listings included, perhaps samples from the software library to give a flavour of the contents.

A further enhancement would be to give the addresses of the local user groups who are shown in the diary instead of just the vague 'XYZ Group'. I am sure that this would increase the attendance to the advertised meetings.

Yours sincerely,

Steve Smith.

/Ed. I'll try to get more listings in future. I'm sure it would be useful for the software library to advertise its wares. I felt that I was always printing the same addresses in the local groups column but I was wrong! I will try to remember to list the addresses of any group mentioned in the diary who haven't anything in the column./

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DIARY

April

- 3rd Herts Group - Disk Protection & Backup by Bob Sather. 8pm.
9th Hants & Berks Group - See Mackintosh. Also EGM.
12th South London Group - Software Protection and A.G.M. 7.30
BCS - Confessions of a Software Publisher, David Tebbit.
Charing Cross Hotel, The Strand, WC2 - 6 for 6.30pm.
13th Birmingham Group 8pm
16th Croydon Group - Software Protection Methods. 7pm.
21st 5th London Computer Fair, Central Hall, Westminster, SW1
14th Visicalc Beginners Course, Bracknell, Berks.
24th Avon Group

May

- 1st Herts Group - Peter Trinder on the Gutenberg System. 8pm.
4th - 7th The Midland Computer Fair, Birmingham.
10th South London Group - Music 7.30
11th Birmingham Group. 8pm.
13th - 15th The Computer Trade Show, Wembley Conference Centre, Empire Way.
14th Hants & Berks Group.
17th BCS - AGM and the Role of the BCS over the next 10 years.
BCS HQ, 13 Mansfield Street, London W1.
21st Croydon Group - Local Area Networks by Symbiotics. 7pm.
24th - 26th Apple 84, The Fulcrum Centre, Slough.
29th Avon Group

June

- 5th Herts Group - BASUG Special Release Software. 8pm.
8th Birmingham Group. 8pm.
11th Hants & Berks Group.
14th South London Group - High Resolution Graphics 7.30
14th - 17th London Fair at Earls Court
18th Croydon Group - High Res Graphics effectively programmed. 7pm.
26th Avon Group

July

- 3rd Herts Group - Steve Collins on Wizardry. 8pm.
16th Croydon Group - Financial packages; Comparative evaluations. 7pm.

September

- 17th Croydon Group - First line maintenance of Apple systems. 7pm.
19th - 23rd PCW Show at Olympia, London.

N.B. BCS meetings are free. Coffee and biscuits are served before the meeting and informal discussions continue in the Hotel Bar after the meeting.

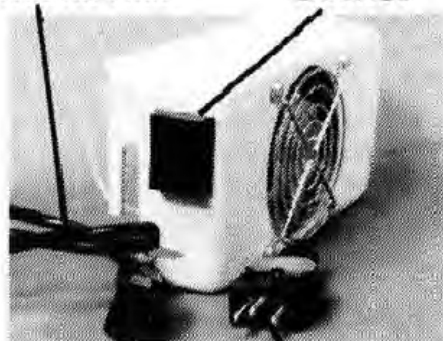
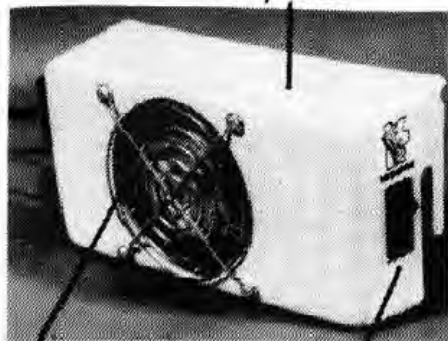
If you would like your events in the diary, please write in and tell us about them.

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